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Paper and Pulp Safety Conference Meets

Twelfth Annual Wisconsin River Valley Safety Session Opens At Rhinelander, June 11 — Wisconsin Men On Superintendents Convention Program — Heavy Rainfall Causes Delay — Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., June 8, 1942—Rhinelander, Wis., will be host to the twelfth annual Wisconsin River Valley Safety Conference Thursday, June 11. A paper and pulp sectional meeting will be held in the afternoon, which is expected to be the largest of the group sessions.

Discussion leaders for the paper and pulp group will be James J. Plzak, claims manager of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., and Clarence J. Muth of Madison, Wis., director of the national committee for the conservation of manpower in industry. There will be a panel discussion, "The Safety Exchange—What Would You Do?" in which the speakers will be Albert F. Baumann of the Marathon Paper Mills Company, Rothschild, Wis., and Dr. Merritt L. Jones of Wausau, Wis. This meeting will be held in the State theater at 2 o'clock.

Earl M. Bowler of the Rhinelander Paper Company, Rhinelander, will preside in his capacity as general chairman of the conference. Folke Becker, president of the Rhinelander Paper Company, heads the advisory committee. General sessions will be held in the morning with a group of safety engineers as speakers, and the conference will conclude with a banquet in the evening at the Rhinelander Memorial building.

Wisconsin Men on Convention Program

Several Wisconsin men are scheduled on the convention program of the American Pulp and Paper Mill Superintendents Association, Inc., at Grand Rapids, Mich., June 16, 17 and 18. Grover Keeth, chief engineer of the Marathon Paper Mills Company, Rothschild, Wis., is first vice-president, and will give the response to the address of welcome by Mayor George W. Welsh of Grand Rapids, at the men's luncheon Tuesday noon. Mr. Keeth is also chairman of the power and plant engineering committee, and will preside at meetings of this group.

Earl F. Otto, of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., will serve as coordinator at the general session Tuesday afternoon at which there will be an open forum on the subject of "Maintenance and Conservation in Pulp and Paper Mills." At this session, V. S. Denison of the Beloit Iron Works, Beloit, Wis., will speak on "Maintenance of Paper Machines."

At Thursday morning's group meetings, George Urban will read a paper at the plant and power engineers' session. He is power assistant for the Marathon Paper Mills Company, and will review his accomplishments in dealing with boiler room operation under the maintenance and conservation plan.

U. S. Paper Corp. to Make Bomb Shell Cases

An order has been booked by the United States Paper Corporation, De Pere, Wis., to manufacture 400 tons of bomb shell casing paper, according to Walter R. Cloud, Sr., manager. Manufacturer will be started about July 1 for shipment to South Chicago, Ill. Most of the raw material is the result of waste paper salvage drives conducted by the Boy Scouts and other organizations in the vicinity.

Cornelius Riggles Named President

Cornelius Riggles was elected president of the Chemical Engineers club of the Kimberly-Clark Corporation, Neenah, Wis., at a picnic meeting Tuesday evening, June 2, at Stroebe's Island, Appleton, Wis. John Limpert was named vice-president, and Glenn Strieby, secretary-treasurer. This was the last monthly meeting until the fall season. Wives of the engineers held a dinner simultaneously at the Guest House in Appleton.

Rainfall Hampers Some Mills

Rainfall averaging almost daily, sometimes in deluge proportions, has been hampering operations in mills and power plants in Wisconsin, although not seriously. The Wisconsin River became a threat to power facilities over the Memorial Day weekend when it reached a crest of more than 12 feet, slightly above the flood stage. Sluicing was arranged all along the stream by the Wisconsin Valley Improvement Company, however, so the waters began to re-

(Continued on page 18)

Strict Control of Newsprint Is Expected

Report That Charles Vining, President of Canadian Newsprint Association Will Be Named Newsprint Controller Viewed As Continuation of Wise Policy—New Wage Rates Adopted—Other News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., June 8, 1942—That Canada will undertake to exercise strict control over the production and distribution of newsprint, to keep these in line with wartime conditions and requirements, is indicated by news from Ottawa that Charles Vining, president of the Canadian Newsprint Association will shortly be named newsprint controller for the Government under the Wartime Prices and Trade Board, succeeding G. M. Smith, of Montreal, who is resigning to enter the army. This does not mean the inauguration of any new policy, but it does mean that in selecting a man of Mr. Vining's standing and authority the Government intends to see that newsprint policy is wisely administered in view of the importance of the industry in contributing to Canada's balance of trade. Later on in the season, should a dry period affect the flow of water, the situation as regards power may become complicated, in view of the large requirements of the ever-increasing production of aluminum and other war materials. This may bring shortages of hydro-electric current in some newsprint producing centres and reallocation of newsprint orders so that they may be most advantageously distributed among the various mills and the regular supply to United States publishers thus assured. Another factor entering into the prospect is that some newsprint mills form the sole means of livelihood for various isolated centres of industry, disruption of which would have serious local effects. Mr. Vining is now engaged in studying Canadian publicity in the United States at the request of the Canadian Government, and is not expected to be formally appointed to the new post until he has presented his report.

Wage Rates Fixed for Forest Workers

The Quebec Regional Labor Board has approved a new schedule of wage rates for forest workers in the province submitted by the Pulpwood Committee of the pulp and paper industry of Canada.

The new schedule divides the province into three zones, namely: zone one, south and west of the Lake St. John region and south of the St. Lawrence and the Gaspesia regions; zone two, the whole Lake St. John region and zone three, north shore of the St. Lawrence River from the Saguenay River up to Labrador.

Although an order-in-council has stabilized the wages at the maximum rates paid November 15, 1941, the new schedule of wage rates was authorized because many employers were found to be paying wages higher than those fixed by an ordinance of the Quebec Commission of Minimum Wages.

The new schedule of wage rates asks that minimum wages paid be those of the provincial ordinance and the maximum ones be the rates fixed by the pulp committee in regard of each zone and each different occupation.

The new rates call for a wage scale covering more than 30 forestry occupations ranging from cookee up to the tractor driver. Comparative figures are unavailable but the new scale ranges from minimum and maximum of $1.17 and $2.00 for cookees and minimum and maximum of $2.31 and $5.50 for tractor drivers.

Prices for Pulpwood

The Commission appointed by the Quebec Government last year to inquire into the prices paid farmers and colonists of the province for the pulpwood has presented a preliminary report of its findings to the Legislature. According to the report, the complaints were:

1. The prices paid for pulpwood are not high enough.
2. In many cases there are too many intermediaries between the producer and the buyer.
3. The cost of transport is generally too high.
4. In certain places, the system of measuring wood is not satisfactory.
5. The system of payment for the merchandise after it is returned from the mill to which it was delivered does not give satisfaction to the producer.
6. Certain buyers refuse to do business with responsible co-operative organizations.
7. In certain districts, there is a lack or absence of competition among the buyers.
8. The price of wood and the sale price of the manufactured product are disproportionate.

The report says that what affects the price of pulpwood in all districts is the cost of transport and especially the rates charged by the railway companies, which were not proportionate with the value of the merchandise, and were almost twice as much as in 1915. This matter was being studied by the railway campanies. The commission urged improvement of secondary roads to facilitate truck haulage, and recommended premiums to colonists and farmers who replant their woods and carry on only reasonable exploitation of the forests. The report further said the commission would probably recommend the appointment of a permanent commission to handle pulpwood industry questions. Such an organization, it said, could control the sale and distribution of pulpwood, furnish information to producers, distributors and consumers and prevent pronounced fluctuations harmful to the producers.

Regional Forest Planning Advocated

A sub-committee of the Canadian Forestry Association that has been surveying post-war rehabilitation policies, recommends the adoption of regional planning in order to integrate forestry, water power and tourist development. In the course of a lengthy report, the sub-committee says:

"Inevitably, the development of forest values must occupy a prominent place in any plan that seeks to enhance the natural resources by utilizing post-war labor. Over 58 per cent of the land area of the nine provinces is occupied by forests. These forests grow

on soils that are for the greater part, of no argicultural value. More than ninety per cent of the national forest acreage is vested in the name of the Canadian people, a recognition of the authority and the responsibility of the people for sustaining the capital values of their woodland estate.

"Planning for any large-scale improvement of the forest resources, through such enterprises as road building and the betterment of fire control, should take into account that all such undertakings must finally justify themselves by adding new stability and vigor to the forest industries. The chief virtue of growing forests is to furnish materials for commercial utilization and in this Dominion where export markets govern forest industry, every constructive measure applied to the raw material source increases the competitive advantages of Canadian mills in world trade.

"The distinction of the Canadian forest industries as paymaster of the largest volume of labor of any industry, except agriculture, is commonly recognized. Few Canadians, however, are aware that in 1941 the favorable balances from trade in wood, wood products and paper totalled over $350 millions and that this vast sum converted an otherwise unfavorable balance of commodity trade of $159 millions to a favorable balance of around $191 millions. Truly a gigantic service to the nation, rendered far more forceful by the critical necessities of war time purchasing abroad."

Northwest Dedicates New Club

At an organization dinner held in the Masonic Temple at Cloquet, Minnesota, on May 6, The Northwest Paper Company employees and guests celebrated the birth of the organization's Quarter Century Club.

Outstanding feature of the evening's impressive ceremonies was the unveiling of a beautiful bas-relief bronze tablet inscribed with the names of those whose service record entitled them to membership in the club. The tablet will occupy a place of honor as a permanent record in the main entrance of the general offices of the company. In addition to this signal recognition of loyal service, exquisitely modeled lapel emblems of gold, appropriately engraved, were presented to the club founders by Stuart B. Copeland, president of the company. Souvenir programs of unusual design and color were distributed to all in attendance.

Since the formation of the Northwest Paper Company in 1898 up to 1942, one hundred and seventeen of the personnel had completed twenty-five or more years of continuous service; ninety-six of these people are still living, and eighty-seven of them are active in the organization. Included in this number are three who have been continuously active throughout the company's forty-four year existence, and sixty-two who have served for more than twenty-five years.

The company and its officers may well be proud of these service records. They symbolize a spirit and morale within the ranks that will continue to be a vital factor in keeping the organization an outstanding institution in the paper industry.

Agree on Newsprint

In a case involving a dutiability of newsprint paper imported at Jacksonville, Fla., from Newfoundland, an agreement has been reached between the Government and the importer after the case was before the United States Custom Court at Jacksonville and New York. The paper was found to be in excess of 4 points in thickness when examined upon importation, and was classified for duty. Investigation, however, showed that the inner portion of the rolls was within the 4 point limitation, and that presumably the portion examined had increased in bulk because of unusual humidity at the time of importation. Under a stipulation that the shipment as a whole did not consist of paper over 4 points in thickness, the paper doubtless will be admitted free of duty, according to the Import Committee of the American Paper Industry.

Revoke Licenses on Paper Machinery

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 10, 1942—The Office of Exports of the Board of Economic Warfare has announced that all general licenses authorizing exports of pulp and paper making machinery in excess of $1,000 and on paper converting machinery in excess of $200 for all destinations other than Canada and Newfoundland have been revoked.

HONOR ROLL OF NORTHWEST PAPER CO.

Joint Printing Committee Awards Contracts

Provides For Some 93,000,000 Pounds of Paper For Use of the Government Printing Office For Six Months' Period Beginning July 1, 1942 — List of the Successful Bidders and Award Prices.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 10, 1942—Awards for some 93,000,000 pounds of paper were announced last week by the Joint Congressional Committee on Printing for the use of the Government Printing Office for the six months period beginning July 1. Bids were received on May 25 from 72 bidders, the largest number of bidders for this paper within the memory of any of the present employees of the Joint Congressional Committee. The awards were as follows:

No. 1. Marquette Paper Corp., 2.50 cents.
No. 2. Graham Paper Co., 4.84 cents.
No. 3. Marquette Paper Corp., 5.97 cents.
No. 4. Marquette Paper Corp., 5.97 cents.
No. 5. Perkins-Goodwin Co., 5.97 cents.
No. 6. Mudge Paper Co., 5.39 cents.
No. 7. Mudge Paper Co., 5.47 cents.
No. 8. Central Ohio Paper Co., 5.47 cents.
No. 9. Central Ohio Paper Co., 5.47 cents (350,000 pounds); Mudge Paper Co., 5.47 cents (350,000 pounds.
No. 10. Butler Company, 5.5432 cents (500,000 pounds); Bermingham & Prosser Co., 5.57 cents (500,000 pounds).
No. 18. Whitaker Paper Co., 6.31 cents.
No. 19. R. P. Andrews Paper Co., 6.66 cents (1,000,000 pounds); Whitaker Paper Co., 6.69 cents (1,000,000 pounds).
No. 20. R. P. Andrews Paper Co., 6.46 cents.
No. 21. Walker, Goulard Plehn Co., Inc., 5.67 cents.
No. 22. Walker, Goulard Plehn Co., Inc., 5.47 cents.
No. 23. Marquette Paper Corp., 7.22 cents.
No. 24. Bermingham & Prosser Co., 16.00 cents.
No. 26. Aetna Paper Co., 11.73 cents.
No. 27. Aetna Paper Co., 11.73 cents.
No. 29. R. P. Andrews Paper Co., 14.87 cents.
No. 33. Marquette Paper Co., 5.73 cents.
No. 34. Marquette Paper Co., 5.58 cents.
No. 35. Graham Paper Co., 5.44 cents.
No. 37. Barton, Duer & Koch Paper Co., 6.05 cents.
No. 38. Barton, Duer & Koch Paper Co., 5.00 cents.
No. 39. Barton, Duer & Koch Paper Co., 4.65 cents.
No. 40. Barton, Duer & Koch Paper Co., 4.65 cents.
No. 41. Butler Co., 6.77 cents (300,000 pounds); Bermingham & Prosser Co., 6.77 cents (250,000 pounds); Walker Goulard Plehn Co., 6.77 cents (450,000 pounds).
No. 43. Aetna Paper Co., 12.06 cents.
No. 44. Old Dominion Paper Co., 4.3424 cents.
No. 45. Whitaker Paper Co., 5.69 cents.
No. 46. Marquette Paper Co., 6.15 cents.
No. 48. Virginia Paper Co., 8.59 cents.
No. 51. D. L. Ward Co., 11.95 cents (300,000 pounds); R. P. Andrews Paper Company, 11.98 cents (300,000 pounds).
No. 52. R. P. Andrews Paper Co., 11.50 cents (white); 12.00 cents (blue).
No. 54. R. P. Andrews Paper Co., 7.24 cents.
No. 55. D. L. Ward Co., 5.72 cents (1,000,000 pounds); 5.94 cents (1,000,000 pounds); 6.13 cents (1,000,000 pounds); Whitaker Paper Co., 5.90 cents (3,000,000 pounds).
No. 56. D. L. Ward Co., 5.72 cents (2,000,000 pounds); Perkins Goodwin Co., 5.90 cents (2,000,000 pounds); R. P. Andrews Paper Co., 5.92 cents (4,000,000 pounds).
No. 57. Whitaker Paper Co., 6.74 cents.
No. 58. D. L. Ward Company, 5.59 cents (500,000 pounds); R. P. Andrews Paper Co., 5.59 cents (500,000 pounds).
No. 59. Whitaker Paper Co., 5.36 cents.
No. 60. North American Pulp & Paper Corp., 8.00 cents.
No. 61. Stanford Paper Co., 6.83 cents (500,000 pounds); D. L. Ward Company, 7.12 cents (1,000,000 pounds).
No. 62. Whitaker Paper Co., 6.61 cents (all except salmon).
No. 64. R. P. Andrews Paper Co., 7.47 cents.
No. 65. R. P. Andrews Paper Co., 11.93 cents (500,000 pounds); Collins Mfg. Co., 13.49 cents (250,000 pounds); 13.79 cents (250,000 pounds).
No. 66. Baxter Paper Co., 15.35 cents (400,000 pounds); R. P. Andrews Paper Co., 15.97 cents (400,000 pounds).
No. 67. Graham Paper Co., 15.25 cents.
No. 68. R. P. Andrews Paper Co., 19.97 cents (100,000 pounds); Paper Corp. of U. S., 21.65 cents (300,000 pounds).
No. 69. Paper Corp. of U. S., 21.65 cents.
No. 70. Paper Corp. of U. S., 21.65 cents.
No. 71. North American Pulp & Paper Corp., 8.25 cents.
No. 72. Bermingham & Prosser Co., 7.74 cents.
No. 73. Bermingham & Prosser Co., 9.00 cents.
No. 75. Marquette Paper Co., 20.00 cents (150,000 pounds); Marquette Paper Co., 22.00 cents.
No. 76. Chicago Paper Co., 17.25 cents (200,000 pounds); Butler Co., 17.97 cents (200,000 pounds); Butler Co., 18.62 cents (200,000 pounds); Walker Goulard Plehn Co., 18.43 cents (100,000 pounds); Stanford Paper Co., 18.00 cents (100,000 pounds); Stanford Paper Co., 18.75 cents (100,000 pounds).
No. 77. Walker Goulard Plehn Co., Inc., 17.97 cents (100,000 pounds); Mudge Paper Co., 18.13 cents (50,000 pounds).
No. 78. Bermingham & Prosser Co., 19.03 cents (200,000 pounds); Walker Goulard Plehn Co., 19.80 cents (100,000 pounds; Paper Corp. of U. S., 20.24 cents (200,000 pounds).
No. 84. Baxter Paper Co., 26.50 cents.
No. 85. Barton, Duer & Koch Paper Co., 19.75

WESTWARD HO! Out across the prairies from the last outposts of civilization the wagon trains of the pioneers stretched a course of progress that did much to extend and consolidate the growth of our nation. It was this spirit of enterprise, banding together the resources, courage and skill of able, sincere and purposeful people, that has made our nation truly great.

THE HISTORIC COURSE OF PROGRESS...

FROM CURRIER & IVES, BY HARRY T. PETERS. REPRINTED BY PERMISSION FROM DOUBLEDAY, DORAN AND COMPANY, INC.

The uniting of the Niagara Alkali Company and the Electro Bleaching Gas Company marks a similarly able, sincere and purposeful endeavor. Now, as one unified source of supply, Niagara Alkali Company will be able to serve important chemical needs of American Industry on an expanded scale to traditional quality standards.

Niagara
ALKALI COMPANY
60 EAST 42nd STREET, NEW YORK, N. Y.

CAUSTIC POTASH · CAUSTIC SODA
PARA · CARBONATE OF POTASH
Liquid Chlorine

EBG NIAGARA ALKALI COMPANY

cents (150,000 pounds); 21.25 cents (150,000 pounds).

No. 102. D. L. Ward Co., 6.21 cents.

No. 105. Whitaker Paper Co., 14.48 cents.

No. 106. Bulkley Dunton & Co., 11.31 cents (400,000 pounds); Central Ohio Paper Co., 11.96 cents (100,000 pounds); Aetna Paper Co., 11.94 cents (800,000 pounds); Whitaker Paper Co., 11.98 cents (200,000 pounds).

No. 107. Baxter Paper Co., 11.11 cents (300,000 pounds); Collins Mfg. Co., 11.47 cents (750,000 pounds); Butler Co., 11.698 cents (400,000 pounds); Merriam Paper Co., 11.11 cents (300,000 pounds); Whitaker Paper Co., 11.11 cents (200,000 pounds); Whitaker Paper Co., 11.71 cents (100,000 pounds); Aetna Paper Co., 11.72 cents (50,000 pounds).

No. 108. Willcox Walter Furlong Paper Co., 11.11 cents (200,000 pounds); Forest Paper Co., 11.11 cents (300,000 pounds); Collins Mfg. Co., 11.47 cents (750,000 pounds); Collins Mfg. Co., 11.87 cents (350,000 pounds); Aetna Paper Co., 11.72 cents (100,000 pounds); Butler Co., 11.82 cents (400,000 pounds).

No. 109. Chicago Paper Co., 13.75 cents.

No. 110. R. P. Andrews Paper Company, 13.93 cents.

No. 111. Stanford Paper Company, 12.29 cents (200,000 pounds); Garrett-Buchanan Co., 12.44 cents (200,000 pounds); Whiting-Patterson Co., Inc., 12.44 cents (200,000 pounds); Aetna Paper Co., 12.47 cents (200,000 pounds).

No. 112. Forest Paper Company, Inc., 11.35 cents (300,000 pounds); Graham Paper Co., 11.36 cents (100,000 pounds); Collins Mfg. Co., 12.07 cents (600,000 pounds); Graham Paper Co., 12.13 cents (200,000 pounds).

No. 120. Walker Goulard Plehn Co., 16.15 cents.

No. 121. Chatfield & Woods Co., 12.30 cents.

No. 122. Chatfield & Woods Co., 12.40 cents.

No. 123. Collins Mfg. Co., 14.42 cents.

No. 125. Paper Corp. of U. S., 21.50 cents.

No. 126. Stanford Paper Co., 20.49 cents.

No. 128. Baxter Paper Co., 21.55 cents.

No. 129. Chatfield & Woods Co., 20.50 cents.

No. 140. Old Dominion Paper Co., 25.96 cents.

No. 141. Paper Corp. of U. S., 23.65 cents.

No. 151. Whitaker Paper Co., 6.82 cents.

No. 154. R. P. Andrews Paper Co., 11.33 cents.

No. 155. R. P. Andrews Paper Co., 12.03 cents.

No. 156. Collins Mfg. Co., 12.73 cents.

No. 160. Baxter Paper Co., 13.05 cents.

No. 161. Graham Paper Co., 13.35 cents.

No. 162. Collins Mfg. Co., 14.71 cents.

No. 168. Bulkley Dunton & Co., 18.50 cents.

No. 169. Barton, Duer & Koch Paper Co., 18.50 cents.

No. 170. Paper Corp. of U. S., 20.00 cents.

No. 176. Barton, Duer & Koch Paper Co., 22.90 cents.

No. 177. Barton, Duer & Koch Paper Co., 22.90 cents.

No. 183. Marquette Paper Co., 6.23 cents.

No. 184. Marquette Paper Co., 6.23 cents.

No. 189. R. P. Andrews Paper Co., 12.87 cents.

No. 190. Barton, Duer & Koch Paper Co., 12.68 cents (300,000 pounds); R. P. Andrews Paper Co., 12.95 cents (300,000 pounds).

No. 191. Barton, Duer & Koch Paper Co., 13.68 cents.

No. 192. Aetna Paper Co., 12.99 cents.

No. 195. Barton, Duer & Koch Paper Co., 22.65 cents.

No. 196. Barton, Duer & Koch Paper Co., 22.65 cents.

No. 201. Marquette Paper Co., 7.41 cents.

No. 202. Marquette Paper Co., 7.82 cents.

No. 203. Whitaker Paper Co., 6.94 cents.

No. 205. Bradner Smith & Co., 10.88 cents.

No. 208. National Pulp & Paper Co., Inc., 4.65 cents (carload lots).

No. 209. Bulkley Dunton & Co., 4.25 cents.

No. 210. Whitaker Co., 4.55 cents (car lots).

No. 211. Paper Corp. of U. S., 7.52 cents.

No. 213. R. P. Andrews Paper Co., 19.50 and 18.50 cents.

No. 215. Mudge Paper Co., 20.50 cents.

No. 217. R. P. Andrews Paper Co., 4.79 cents.

No. 218. R. P. Andrews Paper Co., 4.79 cents.

No. 219. R. P. Andrews Paper Co., 4.54 cents.

No. 252. Old Dominion Paper Co., $10.8648 per M sheets.

No. 254. Whitaker Paper Co., 7.04 cents.

No. 255. Whitaker Paper Co., 7.04 cents.

No. 265. Paper Corp. of U. S., 7.74 cents.

No. 271. Paper Corp. of U. S., 6.00 cents.

No. 276. Barton, Duer & Koch Paper Co., 8.25 cents.

No. 277. Barton, Duer & Koch Paper Co., 9.25 cents.

No. 280. Paper Corp. of U. S., 10.37 cents.

No. 281. Paper Corp. of U. S., 4.50 cents.

No. 302. Stanford Paper Co., $26.50 per M sheets.

No. 303. Stanford Paper Co., $38.20 per M sheets.

No. 304. Stanford Paper Co., $53.80 per M sheets.

No. 305. Stanford Paper Co., $33.50 per M sheets.

No. 306. Old Dominion Paper Co., 5.094 cents.

No. 307. Barton, Duer & Koch Paper Co., 5.35 cents.

No. 308. Old Dominion Paper Co., 5.2434 cents.

No. 309. Old Dominion Paper Co., 5.2434 cents.

No. 325. R. P. Andrews Paper Co., 5.44 cents.

No. 326. Barton, Duer & Koch Paper Co., 5.42 cents (1,000,000 pounds); R. P. Andrews Paper Co., 5.44 cents (1,500,000 pounds); Whitaker Paper Co., 5.47 cents (500,000 pounds).

No. 327. Whitaker Paper Co., 5.47 cents.

No. 351. Whitaker Paper Co., $7.59 per C sheets.

No. 352. Barton Duer & Koch Paper Co., $18.85 per C sheets.

No. 360. Whitaker Paper Co., 2.084 cents.

No. 366. Mathers-Lamm Paper Co., 4.035 cents.

No. 367. R. P. Andrews Paper Co., 4.14 cents.

No. 368. Barton, Duer & Koch Paper Co., 5.25 cents.

Heads Russian Relief for Paper

Election of William F. Hurlburt, vice-president of the International Paper Co., as chairman of the Pulp and Paper Industries Division of the New York fund-raising campaign of Russian War Relief, Inc., was announced last week by Allen Wardwell, Chairman of the New York campaign committee.

Mr. Hurlburt is completing organization of a committee which will conduct an intensive campaign for contributions from all parts of the pulp and paper industry.

Russian War Relief is conducting a national drive for $6,000,000 for its 1942 relief work.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending June 6, 1942

STOCKS

	High	Low	Last
A. P. W.	....	....	....
Armstrong Cork Co.	27	26½	26½
Celotex Corp.	7⅜	6⅞	7⅛
Celotex Corp., pf.	69¾	69¾	69¾
Certain-Teed Products Corp.	2	1¾	2
Certain-Teed Products Corp., pf.	25¾	24½	25
Champion Paper & Fibre Co.	14¾	14½	14⅝
Champion Paper & Fibre Co., pf.	99	98	99
Congoleum Nairn Co.	14½	14	14
Container Corp. of America	13½	13	13
Continental-Diamond Fibre Co.	7	7	7
Crown-Zellerbach Co.	10½	10⅜	10⅜
Crown-Zellerbach Co., pf.	77	77	77
Dixie-Vortex Co.—A.	35	34½	34½
Flintkote Co.	11⅛	10¾	10½
Robert Gair	1⅜	1⅜	1⅜
Robert Gair, pf.	9¾	9⅝	9¾
International Paper Co.	9⅞	9⅞	9¾
International Paper Co., pf.	52⅛	50	50½
Johns-Manville Corp.	58	55½	58
Johns-Manville Corp., pf.	....	....	....
Kimberly-Clark Corp.	....	....	....
MacAndrews & Forbes	18½	17½	18
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	24¾	24	24¾
Mead Corp.	6½	6¼	6½
Mead Corp., pf.	71	70	70
Paraffine Companies, Inc.	28	26½	28
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	8½	8	8⅛
Rayonier, Inc., pf.	25	24½	25
Ruberoid Co.	17⅜	17⅜	17⅜
Scott Paper Co.	31	30	30
Scott Paper Co., pf.	114	112⅞	113⅞
Sutherland Paper Co.	20	19⅞	20
Union Bag & Paper Corp.	8⅝	8	8⅜
United Paperboard Co.	3⅛	3⅛	3⅛
U. S. Gypsum Co.	47½	45⅞	46¾
U. S. Gypsum Co., pf.	....	....	....
West Virginia Pulp & Paper Co.	13¼	13⅛	13¼

BONDS

Abitibi Pulp & Paper Co. 5s '53	45	44⅝	44⅝
Celotex Corp. 4½s '47	96	96	96
Certain-Teed Products Corp. 5½s '48	87	85¾	86¾
Champion Paper & Fibre Co. 4¾s '50	105	104⅞	104⅞
Champion Paper & Fibre Co. 4¾s '50	103	103	103
International Paper Co. 6s '55	105	104⅝	104⅞
International Paper Co. 5s '47	103⅞	103½	103½
Mead Corp. 4½s '55	....	....	....
West Virginia Pulp & Paper Co. 3s '54	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending June 6, 1942

STOCKS

	High	Low	Last
American Box Board Co.	....	....	....
Brown Co., pf.	....	....	....
Great Northern Paper Co.	28¼	27	28¼
Hummel-Ross Fibre Corp.	3⅝	3⅝	3⅝
National Container Corp.	8¼	8¼	8¼
St. Regis Paper Co.	1½	1⅜	1½
St. Regis Paper Co., pf.	111	111	111
Taggart Corp.	....	....	....

BONDS

American Writing Paper Co. 6s '61	81¼	81¼	81¼

Bathurst Issues Good Report

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., June 8, 1942—The Bathurst Power and Paper Company, which is one of the few paper companies issuing interim reports for the information of shareholders (others are Abitibi and International), reports a substantial improvement in net profits for the first quarter of 1942 in comparison with a year ago and a further expansion in net working capital as of March 31, 1942, in comparison with the position as of December 31, 1941.

In a circular accompanying current dividend cheques (25c regular plus 25c extra on the Class A shares), it is stated that the net profit for the quarter was $255,054, subject to audit and year end adjustments, after depreciation at increased rates made applicable last year, depletion, and after providing for Dominion income and excess profits taxes on the basis of 1941 tax rates. This compares, after adjusting depreciation by the proportion of the additional amount absorbed in the last quarter of 1941, with $192,477 in the first quarter of last year. This net profit was equal to 63.8c per Class A share, against 48c a year ago.

As of March 31, 1942, current assets, including cash and marketable securities of $1,770,431, amounted to $5,152,909, exceeding current liabilities of $1,306,604 by $3,846,305. As of December 31, 1941, current assets, including cash and securities at $1,006,748, amounted to $4,487,638, exceeding current liabilities of $837,929 by $3,649,709, the improvement on the quarter being thus approximately $200,000.

Barrell's Paper Annual

Barrell's Paper Annual, 1942-1943, is an 80-page book, published by the William L. Barrell Co., Lawrence, Mass. Copies are available to officials and executives of paper mills without charge.

This first issue was compiled by William Bond Wheelwright of the Callaway Associates, Boston, Mass. It is attractively cased in stiff duck covers, of a green tint, with the title stenciled in black and with a green plastic shelf back.

The annual is dedicated to American papermakers. The text presents an outline of the progress of the paper industry in graphic form; an illustrated directory of officials of associations in the paper industry; useful paper trade terms; a special article on dryer felts, and a suggested list of the most useful books for those engaged in the paper and pulp industry.

Gaylord Nets 38 Cents

The Gaylord Container Corporation and its subsidiary for the March quarter, reported a net profit of $273,133, equal, after preferred dividend requirements, to 38 cents a share on 539,221 shares of common stock, compared with $211,838, or 26 cents a share, in the same period in 1941. Federal and State income and Federal excess profits taxes amounted to $1,127,800 for the first quarter of this year, against $171,300 last year.

Chillicothe Elects Officers

CHILLICOTHE, Ohio, June 8, 1942—At a meeting of the board of directors of the Chillicothe Paper Company, held on June 1, Austin P. Story was elected president and treasurer; Edwin F. Bearce was elected vice-president and production manager and Russell McVicker was elected to the board of directors to fill the vacancy caused by the death of his father, Hector McVicker, the president and founder of the company.

Flintkote Votes Dividend

The Flintkote Company has declared a dividend of 15 cents a share on its common stock. The company paid 25 cents each in the five preceding quarters.

CONSTRUCTION NEWS

Under limitations order L-41 all projects involving expenditures of more than $5,000 must be specifically approved by the War Productions Board. The status of projects reported herewith under the provisions of this order is not known.

Pensacola, Fla.—The Armstrong Cork Company, manufacturer of insulating board products, has completed plans for new addition to local mill, to be one-story, about 107 x 260 feet. It will be used primarily for storage and distributing service. Cost estimated over $50,000, with equipment. Erection is scheduled to be placed under way at once.

Grand Rapids, Mich.—The Michigan Tag Company, 1600 Monroe street, N.W., manufacturer of tags, labels and kindred paper products, has approved plans for one-story addition, to be used for storage and distribution. A building permit has been issued and work will proceed at once. No estimate of cost announced.

Phillipsburg, N. J.—The Canister Company, North Broad street, manufacturer of fiber boxes, cans and other containers, has awarded general contract to E. C. Machin Company, Allentown, Pa., for proposed new addition to plant, recently noted in these columns, and will proceed with superstructure at early date. It will be two-story, about 60 x 228 feet, and is reported to cost over $350,000, including equipment. Output will be given over to fiber containers for packing and shipping of certain munitions. Paul Beidler, Bethlehem Trust Building, Bethlehem, Pa., is architect; Gravell & Duncan, Architects' Building, Philadelphia, Pa., are consulting engineers.

Detroit, Mich.—Fire recently damaged a portion of storage and distributing building of the Detroit Waste Products Company, 1325 Monroe street, waste paper stocks. An official estimate of loss has not been announced. The structure is occupied under lease and damage to building will be replaced, it is said, at early date.

Los Angeles, Calif.—The California-Oregon Paper Mills, 2001 East 57th street, Vernon, Los Angeles, manufacturer of kraft and other paper stocks, has work under way on one-story addition, for which general contract recently was awarded to William P. Neil Company, 4814 Loma Vista street, Los Angeles. It will be used for general operating service. No estimate of cost has been announced.

Perth Amboy, N. J.—The Philip Carey Manufacturing Company, Cincinnati, Ohio, manufacturer of roofing papers, insulating paper stocks, asbestos paper board products, has work nearing completion on new branch mill at Perth Amboy, comprising former plant of Pardee Tile Works, Inc., South street, fronting on the Raritan River, acquired a number of months ago. New mill will be given over primarily to the production of roofing products, including roofing papers, and is scheduled to be placed in operation at early date. It consists of a group of one and two-story buildings, aggregating close to 200,000 square feet of floor space, and will be developed for large output. Modernization and improvements have been under way for some time past, with installation of machinery and equipment. Company recently has arranged for the sale of a bond issue of $2,000,000, proceeds to be used for general financing, corporate purposes, operations, etc.

Knowlton, Wis.—The Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., manufacturer of coated and other paper stocks, is continuing its awards of contracts for different work for construction of new hydroelectric generating station at Knowlton, previously referred to in these columns. An award for roofing has been made to E. D. Chase Company, Oshkosh, Wis., Plumbing and heating will be carried out by company forces, similar to main construction work, which has now been completed above first floor. Entire project is estimated to cost about $1,500,000, including hydraulic turbines, electric generators and auxiliary equipment.

Montreal, Que.—Ajax Fiberboard, Ltd., recently organized, has tentative plans for new mill on local site for the production of fiber board products. It will be one-story, reported to cost over $50,000, including equipment. New company is represented by D. C. Abbott, 275 St. James street, West, Montreal, attorney.

Cornwall, Ont.—Recent report in these columns that Howard Smith Paper Mills, Ltd., 407 McGill street, Montreal, Que., would construct an addition to mill at Smithville, is in error, and no such expansion is planned at this time. Similarly, reference to contract for construction to A. F. Byers Construction Company, Ltd., Montreal, is erroneous, no such award having been made.

New Companies

Wilmington, Del.—The Industrial Supply Company, Inc., has been incorporated with capital of 100 shares of stock, no par value, to manufacture paper and pulp specialties. It is proposed to operate a paper converting plant in this vicinity. New company is represented by Albert W. James, Delaware Trust Building, Wilmington, attorney.

Detroit, Mich.—Fiberized Materials, Inc., 2420 National Bank Building, Detroit, has been organized to manufacture and deal in fiber products, paper specialties, etc. H. H. Konola, 19995 Littlefield street, Detroit, is principal incorporator.

Lee Bartholomew Promoted

Lee Bartholomew, heretofore manager of the Cleveland, Ohio, division of Celotex Corporation, Chicago, Ill., has been appointed assistant general sales manager of the company, with headquarters at last noted place. Previously he was for two years general sales manager of Celotex, Ltd., London, England. He returned to the United States in June 1940, and has been in Cleveland since that time. He will be succeeded as Cleveland division manager by E. E. Dierking, formerly assistant manager.

CAMACHINE 10-14D

For low cost production of

NARROW BOARD ROLLS

(up to 72" in diameter)

THIS MACHINE is designed especially for high-speed low cost production of narrow width paper board rolls up to 72" in diameter. Camachine 10-14D operates at speeds up to 1500 F.P.M. and slits rolls to as narrow as ½" in width. Finished rolls up to 50 inches in diameter can be produced on the standard model Camachine 10-14D. At extra cost the same machine can be equipped to handle rolls up to 72 inches.

Special features adapted especially to paper board mill requirements are the water-cooled mill roll brake, and the large diameter rewind drums which avoid cracking the web when threading up the machine.

Write for interesting folder.

CAMERON MACHINE COMPANY, 61 Poplar Street, Brooklyn, New York
MIDWEST OFFICE: Harris Trust Building, 111 West Monroe Street, Chicago

Glatfelter Club Meets

Fifty members of the Quarter Century Club of the P. H. Glatfelter Company were entertained at a banquet May 19 in Spring Grove, Pa. This was the sixth annual banquet of the Club founded in 1935. Silver pins were awarded to six new members who became eligible for induction into the club this year.

Of the fifty members six are wearers of gold pins indicating fifty years or more of continuous employment. Of these, George F. Hawkins and Phares E. Jamison have been with the company 59 years; Daniel Jamison, Virginia Ruth and William L. Stambaugh, 53 years; and Daniel S. Baker, 51 years.

During the business session following the banquet

THE SPEAKERS' TABLE

these officers were elected: P. H. Glatfelter, president of the company, president; S. C. Wentz, first vice president; George F. Hawkins, second vice president; H. F. Mahaley, secretary; and Allen J. Beck, treasurer.

Seated at the speakers table were J. C. Overmiller, secretary; D. S. Baker, foreman of the beater room; W. S. McClellan, vice president and sales manager; W. S. Shipley, chairman of the board, York Ice Machinery Corporation; and P. H. Glatfelter, president. All the men except Mr. Shipley are connected with the P. H. Glatfelter Company.

Mr. Glatfelter was toastmaster and gave a short address in which he discussed the relationship between social security and national security during the present emergency, stating that without national security there could be no hope for social security. W. S. McClellan, vice president and sales manager of the company, and member of the local rationing board, followed with remarks about the possible future of the paper industry and an explanation of the rationing systems already established. Paul Koenig, assistant treasurer of the company, discussed plant improvements now underway and those planned for the future.

The principal speaker of the evening was W. S. Shipley, Chairman of the Board of the York Ice Machinery Corporation, York, Pa., who has gained national prominence through his sponsoring of the now famous "York Plan" for the cooperation among manufacturers in the production of war materials.

Mr. Shipley spoke of the close association of his company and the P. H. Glatfelter Company, both of which were founded by the late P. H. Glatfelter. He paid a glowing tribute to the workmen of York County whose length of service in the many industrial plants in this locality bears witness to their skill, loyalty and dependability.

Kalamazoo TAPPI Golf Tournament

The Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry met at the Kalamazoo (Mich.) Country Club on Thursday, June 4.

The afternoon was devoted to a golf tournament. In this Leslie Rayle and Al. Perlick tied for blind bogey honors. Vern Bullock had low gross. Arthur Coffin had high gross and Paul Bartholomew the largest number of strokes at the water hole.

In the evening Ralph Hayward, President of TAPPI, was the dinner speaker. Mr. Hayward discussed the policies of TAPPI, explaining that one of its main functions is the development of men within the industry, leading to the improvement of processes, machines and the industry. He described some of the current economic trends in the industry and predicted a rise in business by summer or early fall.

New officers were chosen as follows: Chairman: Frederick D. Elliott, Michigan Research Laboratories; Vice Chairman: Arthur Weinland, Lee Paper Company; Secretary: Frank Hamilton, Allied Paper Mills; Treasurer: E. B. Taylor, American Cyanamid and Chemical Company.

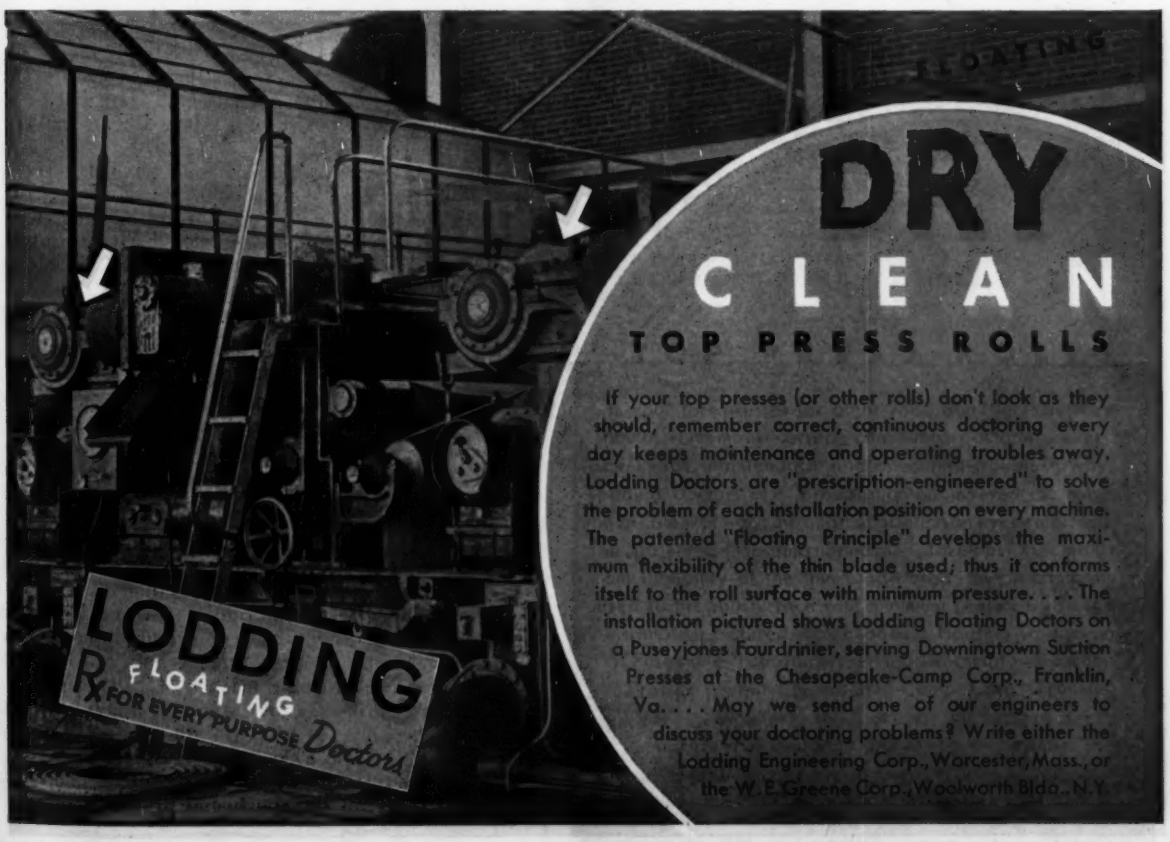
Those present included: Ralph Atkins, A. W. Ayles, C. L. Bachelder, P. W. Bartholomew, Jack R. Bell, R. C. Bishop, Harry Bradford, Robert Buss, O. W. Callighan, Fred L. Chappell, Jr., Chris Coertse, Art Coffin, B. H. Cooper, W. F. Costello, N. J. Cowie, F. M. Davis, Paul de Guehery, Jack Dickson, Gordon Dilns, W. P. Dohne, F. D. Elliott, D. R. Erickson, Brit Freeman, C. E. Gardner, G. H. Gerpheide, G. E. Graham, M. J. Gramdois, F. R. Hamilton, W. F. Hathaway, A. E. Hays, Ralph Hayward, Geo. Jubb, Frank Kennet, A. R. Kloosterman, Les LaLiberte, Frank Libby, Joe Loughead, Roy Marston, R. T. Mashburn, A. B. Milham, R. R. Milroy, Leon H. Mimms, Wm. Murphy, C. H. Noble, Al Perlick, A. R. Prout, Les Rayle, Paul Screiber, W. L. Shaw, Al Sherwood, C. B. Smith, Homer G. Stafford, M. V. Stilson, John Stroud, E. B. Taylor, James Verdon, Joe Waber, A. P. Wandtke, Harris O. Ware, Arthur Weinland, Arnold Weller, Frank Whittington and Art E. Woolam.

George D. Burns Made Manager

Daniel M. Hicks (Inc.), 565 Fifth avenue, New York, dealers in fibers and paper mill supplies, announce with regret, the resignation of George D. Burns as vice-president and a director of the company, as of June 1.

Mr. Burns, associated with Daniel M. Hicks (Inc.) for over 27 years, has assumed the management of the Winona, Minn., and Wilmar, Minn., Flax Tow Mills, of the Winona Fibre Corporation for whom Daniel M. Hicks, Inc., are sole selling agents.

Mr. Burns has taken his new position with the sincere best wishes and expectations of his former associates for his success, to which will be added those of his many friends in paper and textile mill circles.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FLOATING
Rx FOR EVERY PURPOSE Doctors
DRY
CLEAN
TOP PRESS ROLLS
If your top presses (or other rolls) don't look as they should, remember correct, continuous doctoring every day keeps maintenance and operating troubles away. Lodding Doctors are "prescription-engineered" to solve the problem of each installation position on every machine. The patented "Floating Principle" develops the maximum flexibility of the thin blade used; thus it conforms itself to the roll surface with minimum pressure. . . . The installation pictured shows Lodding Floating Doctors on a Puseyjones Fourdrinier, serving Downingtown Suction Presses at the Chesapeake-Camp Corp., Franklin, Va. . . . May we send one of our engineers to discuss your doctoring problems? Write either the Lodding Engineering Corp., Worcester, Mass., or the W. E. Greene Corp., Woolworth Bldg., N. Y.

★★★★★★★★★★★★

"CINCINNATI" BELTS ARE HELPING PAPER MILLS SUPPLY U. S.

U. S. needs paper, millions of tons of it and Cincinnati Transmission Belts are helping paper mills meet those unprecedented demands. "Keep them flying" has been translated by Cincinnati Transmission Belts into "Keep power flowing steadily" to help meet war needs of U. S.

THE CINCINNATI RUBBER MFG. CO.
CINCINNATI, OHIO

These "Cincinnati" Products Are Also Doing Important War Duty

CONVEYOR BELTS - RUBBER COVERED ROLLS
HOSE - SHEET RUBBER - MOLDED PRODUCTS

SAFETY CONFERENCE MEETS

(Continued from page 7)

cede on Monday of last week. Operations were partially interrupted at the Consolidated Water Power and Paper Company's mill at Biron, Wis., and the resumption at the Nekoosa and Port Edwards mills of the Nekoosa-Edwards Paper Company after the holiday shutdown was delayed until Tuesday. There have been no reports of damage thus far, due to effective warnings by the weather bureau.

Barge shipments of coal from Green Bay, Wis., to mills of the Fox River Valley had to be suspended entirely by the Fox River Navigation Company last week. The swollen waters made navigation impossible, but it was believed the current would subside sufficiently to resume this week. It has been necessary to use two tugs most of the spring to move barges in the swift waters. Unless there are more heavy rains, Ben Prugh, manager of the navigation company, believes sufficient coal deliveries can still be made before the fall freezup to take care of all mill needs. He says the deluge is the greatest since 1922.

Marinette Co. Displays War Products

Products of the Marinette Paper Company are part of a war industry display in the lobby of the First National Bank at Marinette, Wis. The mill is turning out tissue for navy orders.

Nuptials in the Paper Industry

Thomas A. Duda, comptroller for the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., and Miss Catherine L. Cahill of Port Edwards, Wis., were married Saturday, May 30, at Port Edwards. The bride was employed in the offices of the Nekoosa-Edwards Paper Company. The couple is honeymooning in the South, and will be at home after June 20 at the Daly Apartments in Wisconsin Rapids.

Robert C. Dosen, technician, and Miss Doris Helen Fitzgerald, industrial nurse, for the Neekoosa-Edwards Paper Company, Port Edwards, Wis., were married Monday, June 1, at the First Reformed church, Manitowoc, Wis. The couple will reside at Wisconsin Rapids, Wis.

Paper and Cordage Men Plan Outing

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., June 8, 1942 — President Harry Smith of the Philadelphia Paper and Cordage Association announces that the golf committee, under the chairmanship of Dick Richards, has arranged an elaborate and enjoyable program of entertainment for the annual outing of the association. This event, which is annually held at the Manufacturers Country Club, Oreland, Pa., is scheduled for Tuesday, June 16 from 10 A. M. until closing. Starting off with the golf tournament in the morning, followed by lunch at 12 noon, there will be tennis and quoits, after which will be closing time for the golf tournament, which is expected to take place at 4 P. M. At 4:30 aquatic sports program, and at 5 o'clock closing time for putting contest; at 6 P. M. 19th hole followed by dinner at 6:30. At 8 o'clock a big surprise is in store for all those present in the shape of a good old fashioned party, at the conclusion of which the distribution of prizes will be made.

Brazil Paper Mill Starts

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 10, 1942—The largest cellulose and paper factory in South America is now in operation in Parana, Brazil, according to a report which has just been made to the Department of Commerce.

It is understood that initial production is at the rate of 100 tons of wood or chemical pulp, 60 tons of bleached and 40 tons of unbleached chemical cellulose daily.

Production of newsprint paper at the rate of 160 tons daily is planned when turbines and other required electrical equipment can be obtained from the United States. Buildings and installation cost about $3,300,000 and most of the machinery is of American manufacture.

Japan Cases Suspended

Many cases now pending in the United States Customs Courts involving the dutiability of paper imported from Japan are being suspended, by request of the importers, for the duration of the war according to the Import Committee of the American Paper Industry. The suspensions have been granted, and no action will be taken until the cases are again placed on Customs Court calendars. Meantime, all duties levied by Customs officials have been paid, and when the cases come again to the court the issue will be whether or not portions of the duty already paid shall be refunded.

To Honor Harry Elish

Harry M. Elish of the Harry Elish Paper Company will be honored for his years of communal service at a dinner to be given by the graphic arts, fine paper and stationery industries on Thursday evening, June 18, at the Essex House, 160 Central Park South, New York. The dinner will also inaugurate the 1942 campaign of the three industries for the United Jewish Appeal, the central fund-raising agency for the Joint Distribution Committee, the United Palestine Appeal and the National Refugee Service.

Samuel T. Baron of the Royal Paper Corporation, and Harold M. Davis of Davis, Delaney & Harris, are serving as co-chairmen of the dinner committee and will also lead the industries' drive for the United Jewish Appeal. They will be aided by an executive committee representing the leaders of every branch of the three trades, each of whom will be responsible for the conduct of the campaign among his own business associates.

In the joint statement announcing the date of the dinner, Mr. Baron and Mr. Davis pointed out that the guest of honor, Harry M. Elish, has devoted much of his time and his energy over the years to the cause of those who have fallen under the heel of the oppressors of mankind.

"In paying a personal tribute to him," the statement said, "we shall also be giving voice to the will of the members of our industries to make help available to the hundreds of thousands of Jewish people who have been hunted from their homes during the last decade.

"Tyranny has decreed the extermination of every last one of these people, but American sympathy and American generosity can still stave off that bitter fate. You may be certain that the men of our industries will do their part."

TRADE AUTOMATIC MARK

Manufacturers for Over Thirty Years

MODERN Electric Propelled INDUSTRIAL TRUCKS

FOR ECONOMICAL MATERIALS HANDLING

- LOW AND HIGH LIFT TRUCKS
- FORK TRUCKS
- PULP AND BALE HANDLERS
- PAPER ROLL HANDLERS
- LOAD CARRIERS
- TRACTORS — CRANES

Capacities 1,000 to 10,000 Lbs.

☆ Center-Control 3000 to 6000 lb. capacity motorized revolving paper roll handlers.

Heavy-duty, center-control fork trucks—telescopic tilting, tiering type for low-cost roll storage and transportation. Capacities 3000 to 6000 lbs.

☆ Center-Control 6000 to 7000 lb. capacity heavy-duty, motorized revolving paper roll handlers.

☆ Box-car bale and roll unloader for single tier storage. 1500 to 2500 lbs.

☆ Box-cars can be loaded and unloaded in record time — with motorized roll upender. Capacities up to 3000 lbs.

☆ Chisel type pulp handlers for box-car loading, unloading and stacking.

☆ 6000 lb. capacity low-lift and high-lift trucks for skid transportation of small rolls and flat stock.

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PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Vol. 114 June 11, 1942 No. 24

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION. Twenty-third Annual Convention, Pantlind Hotel, Grand Rapids, Mich., June 16-18.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Statler Hotel, Boston, Mass., September 30-October 1.

THE JOB AHEAD

There is an old axiom that says we get out of life that which we put into it. That is to say, for the contribution which each individual and business enterprise makes to its age proportionate compensation is received. It may seem difficult to fashion a broad philosophy of the uses of life into an ethical platform of this kind, but progress has been and is being made in that direction. There are exceptions, of course, and it is unfortunately true that, anything approaching a just balance between labor and capital has never been attained. That is, fullest cooperation between these prime economic forces has yet to be achieved. But, there is hope that in the tremendous war effort the United States is making in the interests of self-preservation and the preservation of a liberal civilization in the world, that a great deal more will be accomplished within a few years in the future than has been recorded in many decades in the past.

In commenting on the larger aspect of a liberal civilization and what is commonly referred to as the American way of life, the June 1 issue of the *Washington Review,* published by the Chamber of Commerce of the Unites States says in part: "It goes without saying that freedom implies responsibility. That is as true of free enterprise as it is true of other freedoms; freedom of the press, freedom of religion, freedom for labor and for employers. If freedom, any kind of freedom, is to endure, cognizance must be taken of the obligations that go with it. That rule applies to private enterprise as well as public enterprise. Neither exists for itself alone. The measure of their success is the measure of their contribution to the public welfare. Private enterprise has been, and is now being tested, in the crucible of war. Unprecedented demands have been laid upon it. Its resources have been stretched to the utmost and it is accomplishing, freely and willingly, more than the enemy countries have accomplished under the lash of compulsion and regimentation."

Continuing its discussion of "Tomorrow's Job," the *Review* goes on to say that, "The hour of trial is not yet ended. When the demands of war have been met, other demands, the demand of peace, will be before us. These will be no less insistent, no less important to our national well being. Like the fighting forces, the vast armies of industry must be demobilized. The great industrial plants that have been converted to the uses of war must be reconverted to the uses of peace. The transition cannot be accomplished over night. A vast and complex task lies ahead. Peacetime industries must be revived. Channels of trade, both domestic and foreign, must be reopened. Credit machinery must be overhauled. Employment must be provided for the millions of workers. For free enterprise this presents another, perhaps the supreme test. The outcome may determine whether free enterprise is to survive. One thing is certain: it cannot afford to do too little or be too late."

Closely associated with a large measure of public opinion as to the necessity of preserving the American system of free enterprise, are the current emphatic views of the House and the Senate; the former wants smaller businesses preserved, and the Senate is against government subsidies to protect the maximum prices of the Office of Price Adjustment. The racketeering in organized labor may also be given serious consideration. In reference to small business concerns, the House expressed itself in full measure in the week of May 25. As the *Review* points out, "it expressed even more anxiety than the Senate over their utilization for war work and for their protection for use for essential civilian purposes. The Chairman of the War Production Board is given positive duties in both directions. If the WPB certifies a small concern, or a group of them, as competent in ability for a specific government procurement contract, it is to get the contract, even at a higher price. Similarly, if there is certification of the two-hundred-million Smaller War Plants Corporation, financed by the Treasury, the corporation is to have a contract, to distribute among smaller concerns for execution. The terms of the contract are to be fixed by the WPB. Incidentally, in borrowing from banks neither small nor large concerns are to be subject to the usual limitations in size of loans insofar as there are guarantees or commitments under the plans now being operated in connection with reserve banks and with the aid of a bureau of the WPB."

The *Review* points out that, "Efforts of the OPA to obtain acceptance in the Senate for means to

grant subsidies to protect the price ceilings that went into effect earlier in May, aroused so much dissent that the plan had to be left for further committee consideration. OPA was asking for discretion to grant subsidies, on the theory that whatever else happens, price ceilings must be maintained. As all elements entered into prices are not controlled, the diverse directions in which subsidies could be used caused criticisms that took a wide range. There was an uprising in the Senate that may forecast more stormy sessions; for the way was opened to joining issue on important questions of policy and methods."

OPA Rules on Specialty Paper Board

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 6, 1942—Prices for new specialty paper board items must be submitted to the Office of Price Administration for approval, Price Administrator Leon Henderson stated today in response to inquiries from paper board manufacturers.

Proposed prices must also be approved by OPA for paper board which was not sold, not contracted for sale, nor for which a price was listed by the manufacturer during the base period from October 1, 1940, to October 15, 1941.

Revised Price Schedule No. 32 (Paper Board Sold East of the Rocky Mountains) established prices for paper board which the manufacturers contracted for sale, sold or for which he listed prices during the base period referred to above. Top prices also were established in specific dollars and cents figures for specified paper board items.

Several meetings with paper board manufacturers have been held recently and the correct procedure for pricing the items for which maximum prices are not established by the schedule was outlined by OPA officials as follows:

1. Estimate a proper price for the item.
2. Inform the prospective purchaser that the price submitted is a quotation subject to approval of the Office of Price Administration.
3. Accept the order on the basis of the proposed price, but immediately inform the Office of Price Administration, Washington, D. C., in writing, describing the item, the price, and with whom the contract was made.
4. Complete the formal applications for approval of Price which OPA will send.
5. These applications, containing actual cost information on the "run" involved with identical information on one or more comparable grades, will aid OPA in determining whether the proposed price is justifiable. These applications must be mailed to OPA within 10 days after the item has been produced.
6. The Office of Price Administration will decide whether the price proposed is approved or if a revised price is required.

Howard Tayloe Joins Air Force

[FROM OUR REGULAR CORRESPONDENT]

MEMPHIS, Tenn., June 8, 1942—Howard Tayloe, executive vice president and manager of the Tayloe Paper Company, has received a commission as First Lieutenant in the War Department and will report at Keesler Field, Miss., on June 9. He will be in the Air Arm of the Service.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks, 1942		Corresponding Weeks, 1941	
April 25	100.2	April 26	97.8
May 2	**99.2**	May 3	99.8
May 9	97.8	May 10	99.1
May 16	97.3	May 17	98.6
May 23	98.8	May 24	100.2
May 30 (Prelim.)	*92.3*	May 31	96.8

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1941	85.6	89.7	92.2	96.0	98.7	99.3	94.2
1942	103.8	103.4	102.7	100.2	*95.6*	....	....

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1941	101.0	99.7	105.2	106.2	100.4	97.4
1942	....	....	....	....	....	....

COMPARATIVE YEARLY SUMMARIES

	1935	1936	1937	1938	1939	1940	1941	1942
Year to Date..	68.4	78.0	89.6	67.8	80.1	86.3	92.4	*101.2*
Year Average..	69.9	80.4	79.8	71.5	83.4	85.6	97.8	...

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS †

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1937	83	89	89	91	88	80	69	77	72	70	57	47	75
1938	56	63	63	60	60	59	59	69	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	82	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	82	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	93	*82*	..	..	..	..	..	..	..	..

Week ending Apr. 25, 1942—93
Week ending May 2, 1942—90
Week ending May 9, 1942—86
Week ending May 16, 1942—82
Week ending May 23, 1942—81
Week ending May 30, 1942—77

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

To Assist Rubber Conservation

The B. F. Goodrich Company, Akron, Ohio, is again extending its campaign to assist the rubber conservation among industrial users by suggesting to its distributors that they send their customers a series of letters stressing the possibilities of important rubber goods salvage work in their plants. First of the letters is on belting.

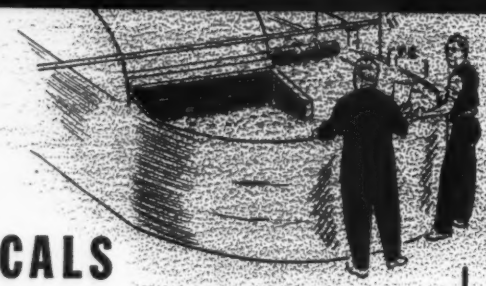
The letters, one of which follows, offer the services of a skilled rubber technician to make a survey of the plant, going over the "worn-out" belting and make recommendations on how much can be salvaged, as well as recommendations on how to get the most service from the belting now in use:—

"No more rubber from Malaya—but it's a good bet that we can find some in your plant! How much worn or damaged rubber belting is lying under benches or in a corner of the stock room?

"Do you know that much of this belting can be repaired and respliced for long additional service? Damaged portions can be removed, worn or cracked plies removed, frayed edges cut away and the belting respliced to sizes and lengths for which you will have immediate need. Vulcanized repairs to conveyor belts will greatly lengthen their service life.

"The rubber shortage is acute and belt salvage is an important means of conservation. We're making it one of our major jobs and our portable electric vulcanizers and trained workmen are going to be kept mighty busy saving rubber.

"We'd like to send a man to help conduct a thorough survey of the belting in your plant—go over your 'worn out' belting to determine how much can be salvaged and tell you how to get the maximum life from belts now operating."



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TWO-FOLD SERVICE. A manufacturer of pulp, paper or paperboard is justified in expecting from his supplier of paper chemicals not only so many tons of supplies, but experienced counsel, whenever needed, on how to secure the most efficient use of these materials in relation to his own mill methods and equipment.

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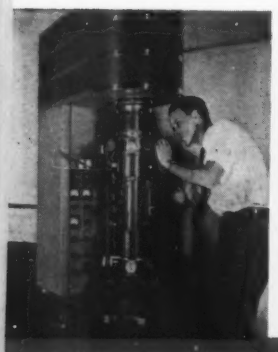

American Cyanamid & Chemical Corporation

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Some Economies in Chlorine Consumption in Bleaching Chemical Wood Pulp*

By John D. Rue[1] and S. C. Nagel[2]

Abstract

The amount of chlorine required to bleach chemical wood pulp by a two-stage process can be reduced by decreasing the proportion of chlorine added in the chlorination stage as evidenced by data obtained in bleaching a Mitscherlich sulphite, a gum-wood sulphate, a southern and a northern coniferous sulphate, and an eastern poplar soda. In every case the darker the shade the greater was the economy realized by reducing the degree of chlorination.

Chlorine requirements also can be reduced by introducing a hot caustic-extraction stage between the chlorination and hypo-chlorite stages. In tests on a Mitscherlich sulphite a saving at the rate of 24 pounds of chlorine per ton of pulp was effected for shades between 75 and 80 brightness by the use of 40 pounds of caustic. The darker the shade the smaller the saving of chlorine.

Consideration of the use of caustic soda to replace chlorine is based on the assumption that it will be more available than chlorine in the national emergency.

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 16-19, 1942.

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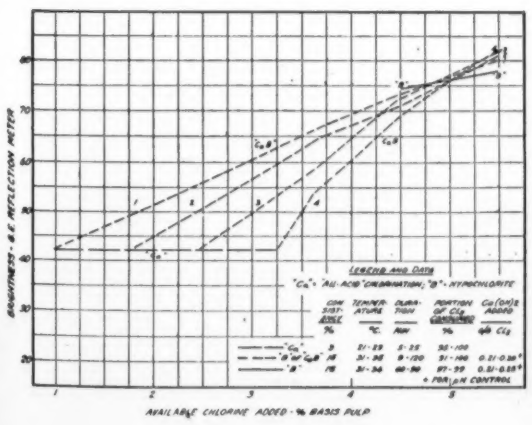

FIG. 1

The Effect of Degree of Chlorination on the Relation of Chlorine Added to Brightness in Bleaching a Mitscherlich Sulphite with the Two-Stage Procedure "All-Acid" Chlorination Followed by Hypochlorite

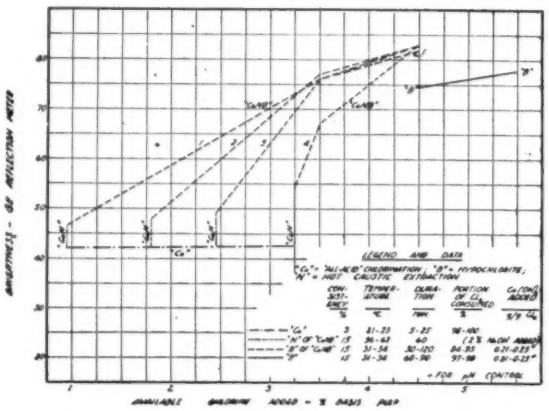
BRIGHTNESS - G.E. REFLECTION METER
AVAILABLE CHLORINE ADDED - % BASIS PULP
LEGEND AND DATA
"Cₑ": "ALL-ACID" CHLORINATION; "B": HYPOCHLORITE;
"H" = HOT CAUSTIC EXTRACTION
CON-SIST-ENCY
TEMPER-ATURE
DURA-TION
PORTION OF Cl₂ CONSUMED
Ca(OH)₂ ADDED
% °C. Min. % gm Cl₂
"Cₑ" 3 21-25 5-25 98-100
"H" OF "Cₑ-H-B" 15 34-43 60 (2 % NaOH ADDED)
"B" OF "Cₑ-H-B" 15 31-34 30-120 84-95 0.21-0.25*
"B" 15 31-34 60-90 97-98 0.21-0.25*
* FOR pH CONTROL

FIG. 2

The Effect of Degree of Chlorination on the Relation of Chlorine Added to Brightness in Bleaching a Mitscherlich Sulphite with the Three-Stage Procedure Consisting of "All-Acid" Chlorination Followed Successively by Hot Caustic Extraction and by Hypochlorite

In normal times economies in the consumption of chlorine are noteworthy only if they are reflected in economies in the cost of production. But, in the present national emergency economies of chlorine are important even though they result in no reduction in the cost of production and may be worthy of consideration even if they involve some increase in cost.

Proportioning of Chlorine Between Stages

It is generally conceded that in the bleaching of pulps to a high brightness the best quality of product is obtained by "forcing" the chlorination and leaving a minimum of reaction to take place in the hypochlorite stage. The improved quality of product obtained under those conditions is obtained at a slight sacrifice in economy of chlorine consumption. However, it is frequently found expedient to leave a larger proportion of the chlorine for use in the hypochlorite stage so as to insure a more effective oxidation of the dirt particles.

For the lower brightness shades of current production, in which the total quantity of chlorine required is reduced, forced chlorination is not essen-

tial to the maintenance of good strength of pulp. Furthermore the need for the relatively slow oxidation of the hypochlorite reaction to reduce the dirt content is even more vital for the lower than for the higher shades. And finally it is believed that for the lower shades greater economy of chlorine consumption can be had by restricting the extent of the chlorination.

Proportioning When Bleaching a Sulphite to the Lower Shades

As a means of securing some quantitive measure of the effect of proportioning on chlorine economy a series of laboratory bleaches was run on a Mitscherlich sulphite pulp in which the procedure used was a chlorination (without neutralization) followed by a hypochlorite bleach. A preliminary series of tests established the curve of relationship between brightness of the chlorinated pulp and chlorine added. Portions of the pulp at several degrees of chlorination were then each subjected to a series of hypochlorite bleaches using progressively increasing amounts of available chlorine. Another series of curves was thus established showing the relation of brightness of the bleached pulp to total chlorine added (*see* Fig. 1).

The curves clearly indicate, that for this particular pulp and within the range of variation of proportions studied, those variations have no appreciable effect on economy of chlorine consumption for a brightness range of 75-80; that for pulps of higher brightness the economy is increased by forcing the chlorination and that for pulps of lower brightness the economy is increased by decreasing the proportion of chlorine used in the chlorination stage. Fortunately the conditions favorable to economy of chlorine are also favorable to the greatest reduction of the dirt content of the pulp.

A similar series of tests was made in each of which a hot caustic extraction stage was introduced between the chlorination and hypochlorite stages (*see* Fig. 2). For a brightness of about 82 the total chlorine consumption was practically the same even though the consumption in the chlorination stage was varied from 1% to 3¼%. For a brightness of 76 the chlorination chlorine could be varied from 1% to 2½% without effecting total chlorine economy, but increasing the chlorination chlorine to 3¼% very materially increased the total chlorine consumption. As the

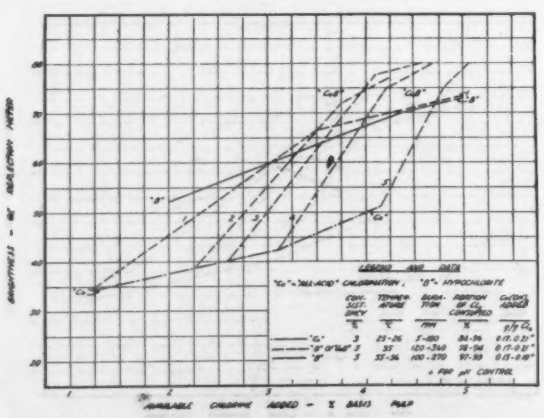

FIG. 3

The Effect of Degree of Chlorination on the Relation of Chlorine Added to Brightness in Bleaching a Gumwood Sulphate with the Two-Stage Procedure "All-Acid" Chlorination Followed by Hypochlorite

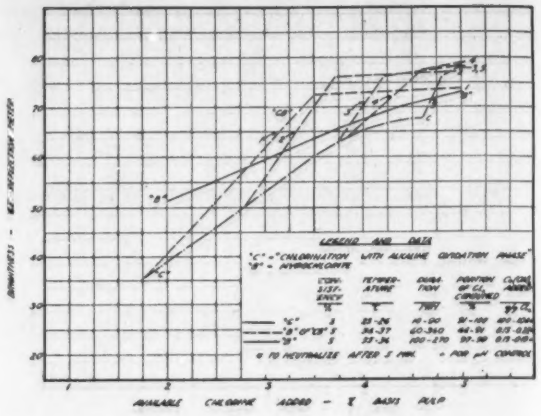

FIG. 4

The Effect of Degree of Chlorination on the Relation of Chlorine Added to Brightness in Bleaching a Gumwood Sulphate with the Two-Stage Procedure "Chlorination with Alkaline Oxidation Phase" Followed by Hypochlorite

brightness was decreased below 76 total chlorine efficiency was materially increased by decreasing the proportion used in the chlorination stage.

Proportioning when Bleaching a Gumwood Sulphate Pulp to the Lower Shades

Two series of two-stage bleaches were run on a sulphate cooked gumwood pulp. In the first series the procedure was similar to that followed for sulphite and the results are shown in Fig. 3. They indicate that for bright shades of that pulp there is permissible only a limited range in the degree of chlorination without materially affecting total chlorine requirements.

For lower shades it is evident that a decrease in the degree of chlorination is accompanied by a decrease of chlorine used, but that in the intermediate range of brightness it is possible to carry that decrease so far as to make it impracticable to attain the desired brightness.

The second series of bleaches on the gumwood sulphate differed from the first in that the chlorination had an alkaline oxidation phase. This means that in each of the actual tests the chlorination was carried on for five minutes and then the pH was promptly raised to a value greater than 8 by the addition of

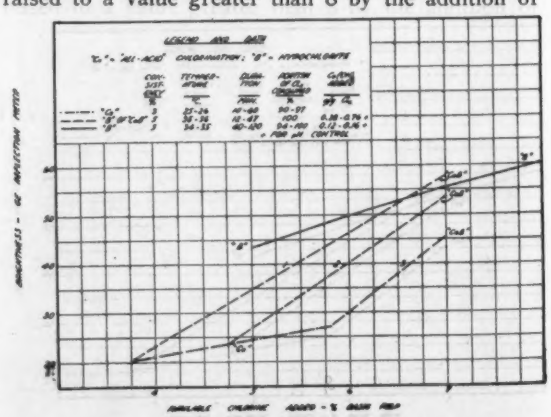

FIG. 5

The Effect of Degree of Chlorination on the Relation of Chlorine Added to Brightness in Bleaching a Southern Coniferous Sulphate with the Two-Stage Procedure "All-Acid" Chlorination Followed by Hypochlorite

TABLE I.—THE EFFECT OF DEGREE OF CHLORINATION ON THE CHLORINE REQUIREMENTS FOR BLEACHING POPLAR SODA TO 70 BRIGHTNESS WITH THE TWO-STAGE PROCEDURE "ALL-ACID" CHLORINATION HYPOCHLORITE

Chlorine Added			Brightness, General Electric reflection meter, Points
"C_a" Stage, %	"B" Stage, %	Total, %	
2.7	1.0	3.7	71.6
2.2	1.0	3.2	69.7
1.4	1.5	2.9	71.1

"C" = "all-acid" chlorination: Consistency 3%, temperature 24 to 25 deg. C. duration 45 minutes, portion of chlorine consumed 77 to 98%.
"B" = hypochlorite: Consistency 4%, temperature 39 to 43 deg. C, duration 110 to 180 minutes, portion of chlorine consumed 85 to 98%, $Ca(OH)_2$ added for pH control 0.13 to 0.42 g/g Cl.

lime. The results of the two stages are shown in Fig. 4.

Within the range studied increasing the chlorine added in the "chlorination with alkaline oxidation phase" resulted in increases in the brightness attainable. For the lower shades definite economies in chlorine were obtained by decreasing the amount used in the first stage.

Proportioning when Bleaching Coniferous Sulphate Pulps to the Lower Shades

Two series of two-stage tests were run on a southern coniferous sulphate cooked for bleaching. In one the chlorination was run without neutralization and in the other it contained an alkaline oxidation phase. The results as shown in Figs. 5 and 6 indicate that in the range of low brightness values decreasing the dosage of chlorine in the first stage resulted in increases in the economy of chlorine use. In the case where "chlorination with alkaline oxidation phase" was used the decrease in the first-stage dosage was carried so far that there was a decrease in the economy of chlorine.

A series of two-stage tests having "chlorination with alkaline oxidation phase" was run on a northern coniferous sulphate. As in the previous cases maximum economy of chlorine used for the brightness shades was realized only when the degree of chlorination was kept within narrow limits. For the darker shades decreasing the degree of chlorination again resulted in increases in chlorine economy (*see* Fig. 7).

Proportioning when Bleaching a Soda Pulp to the Lower Shades

A few two-stage tests having "all-acid" chlorination were run on a poplar soda pulp. As shown in Table I reducing the dosage of chlorine in the first stage brought economies in the chlorine requirements of the process for approximately 70 brightness.

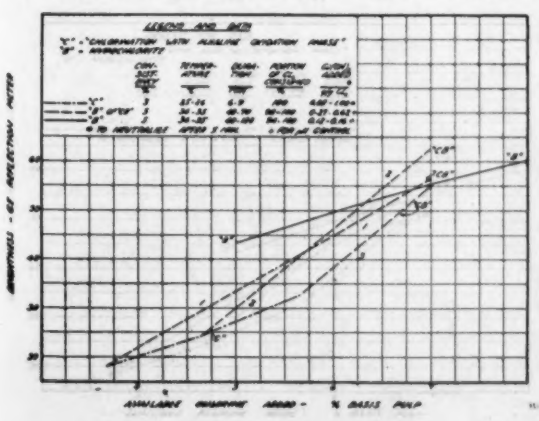

FIG. 6
The Effect of Degree of Chlorination on the Relation of Chlorine Added to Brightness in Bleaching a Southern Coniferous Sulphate with the Two-Stage Procedure "Chlorination with Alkaline Oxidation Phase" Followed by Hypochlorite

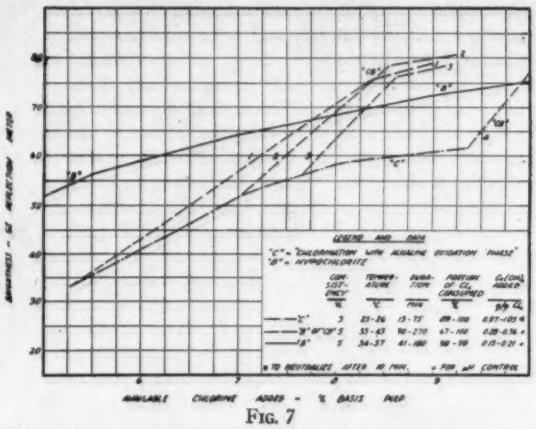

FIG. 7
The Effect of Degree of Chlorination on the Relation of Chlorine Added to Brightness in Bleaching a Northern Coniferous Sulphate with the Two-Stage Procedure "Chlorination with Alkaline Oxidation Phase" Followed by Hypochlorite

Substitution of Caustic Soda for Some of the Chlorine in Bleaching Sulphite Pulp

It is possible to introduce a caustic-extraction stage in the bleaching procedure for sulphite pulps and thus substitute a pound of caustic for, in some cases, as much as one pound of chlorine. As much as 15 to 20 pounds of chlorine per ton of pulp may be replaced in that way without reducing the brightness of the pulp and without appreciably modifying the papermaking characteristics of the pulp. In Fig. 8 two curves have been selected from each of two Figs. 1 and 2. Only the hypochlorite portion of the curves are shown as they are for pulps chlorinated with approximately 1% to 2½% chlorine, respectively. For pulps of brightness between 75 and 80, extraction with 2% NaOH (basis pulp) resulted in a saving of about 1.2% chlorine or 0.6 pounds of chlorine per pound of caustic. Put another way, the caustic extraction reduced the total chlorine consumption a little over 20%. For shades lower than about 75 brightness, obtained by bleaching pulps chlorinated to the same degree, there is a decreasing

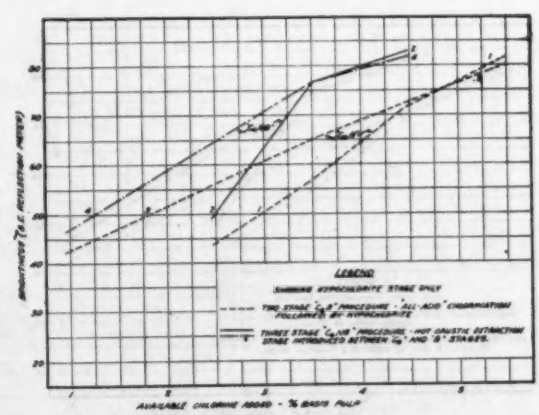

FIG. 8
The Effect of Introducing a Hot Caustic-Extraction Stage between "All-Acid" Chlorination and Hypochlorite Stages on the Relation of Brightness to Chlorine Added in Bleaching a Mitscherlich Sulphite

saving of chlorine by extraction with caustic. (*See* Curves 1 and 3 compared, respectively, with Curves 2 and 4 in Fig. 8.)

If the two methods of reducing chlorine consumption, decreasing the degree of chlorination and introducing a caustic stage, are combined still greater savings in chlorine can be expected. In the comparison of Curve 1 with Curve 4 in Fig. 8 this saving was very nearly the same for a wide range of brightness values. These tests show how widely differing conclusions may be drawn from mill data depending on the history of the pulps used for comparison.

The above observations regarding the use of caustic stages are made with the full realization that the supply of caustic soda itself in so far as is available for nonwar needs may become limited, in which case there would be no point trying to use it to replace chlorine.

Procedures and Brightness Grades in Bleaching Sulphate Pulps*

By John D. Rue[1] and S. C. Nagel[2]

Abstract

This paper concerns the effectiveness of various procedures for bleaching sulphate pulps to shades ranging from manila to full white.

A comparison of the chlorine requirements at various brightness grades was made of several sulphate pulps when bleached with single-stage hypochlorite procedure. In the case of a northern coniferous pulp the strength decreased rapidly as shades above 50 brightness were produced.

In a study conducted on a southern coniferous sulphate cooked for bleaching the following unit procedures were used:

Symbol	Name	Purpose
"C_a"	"All-acid" chlorination	Attack and removal of lignin.
"C"	"Chlorination with alkaline oxidation phase"	Same as "C_a" with supplemental effect of alkaline oxidation.
"N"	Hot caustic extraction	Removal of dye-like substances and residues from chlorination.
"B"	Hypochlorite bleach	Reaction with coloring matter and other impurities.

These unit procedures were arranged in four series so that the pulp was bleached to various shades as it passed through successive bleaching stages.

Series	To brightness →	55	70	80
I		"B"	"BB"	"BCNB"
II		"C_aB"	"C_aBB"	"C_aBNB"
III		"C"	"CB"	"CNB" or "CNBB"
IV		"C"	"CB"	"CBNB"

These procedures were evaluated as regards strength of product and costs for chemicals and pulp. The following conclusions were drawn and have in general been substantiated by other laboratory studies and by experience in commercial operation:

1. For low semibleached shades (40 to 50 brightness) "B" is preferred because the cost of chemicals is low and the strength is not impaired.

2. For bright semibleached shades (65 to 70 brightness) "CB" is preferred because high strength is obtainable. "C_aBB" procedure is more economical of chlorine and lime but it produces a weaker pulp and required a higher capital investment.

3. For full bleached shades (80 brightness or higher) "CNB" and "C_aBNB" procedures have the same relative merits as have "CB" and "C_aBB" procedures when used for bright semibleached shades. For commercial use an additional hypochlorite stage is recommended.

4. From the standpoint of chemical consumption and strength properities of the product there is little choice between "CNBB" and "CBNB."

It is possible to produce from a sulphate pulp grades of brightness which range all the way from the brown of the unbleached to the brightness of a fully bleached sulphite—i.e., from about 20 or 30 to 85 or 90 as determined by the G. E. reflection meter. This range of brightness is greater than obtainable with sulphate pulps and involves a considerable number of possibilities in purification and bleaching procedures. For any degree of brightness there are usually more than one possible procedure or combination of procedures available. They may differ, however, in their effect on economy of production and on quality of product.

The data reported in this paper were accumulated in an effort to determine the effectiveness of some of the available procedures and to indicate a suitable combination of procedures for the simultaneous production of several brightness grades from a single unbleached sulphate pulp as it passes through the successive stages of a single bleachery.

Reaction with Hypochlorites

Sulphate pulps made from coniferous woods react readily with the soluble hypochlorites and consume large proportions of active chlorine but the products usually are not bright and, except for those of low manila shade, possess a strength materially lower than that of the brown pulp.

Pulps differ greatly among themselves in the degree of brightness developed per unit of chlorine required. The relationship for several pulps is shown in Fig. 1. The list includes samples from Europe, Canada, northern and southern United States, and one gumwood pulp.

The extent to which the brightening can be carried by a single hypochlorite reaction without appreciably impairing the strength of the pulp is illustrated by Pulp 542, a northern coniferous sulphate. The data in Table II and Fig. 2 show a maximum bursting and folding strength at a brightness of 45 and retention of a strength equal to that of the unbleached even at a brightness of 50. Progressive brightening beyond about 55 resulted in a rapid loss in strength.

It becomes necessary, therefore, if strong white products are to be obtained from sulphate pulp, that

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* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 16-19, 1942.

[1] Member TAPPI; in Charge of Sales Service, Hooker Electrochemical Company, Niagara Falls, N. Y.

[2] In Charge Pulp Laboratory, Hooker Electrochemical Company, Niagara Falls, N. Y.

chemicals be found that react in a highly selective manner for the removal of impurities and at the same time leave the strength of the cellulose impaired to only a minimum degree. No one chemical has been found practicable commercially to serve that purpose. A series of chemicals are used and are applied successively; each attacking one impurity or one group of impurities until the cellulose is white or so nearly pure that a very mild oxidation is sufficient to make it white. The chemicals are relatively abundant and cheap. Their reactions is connection with the bleaching of sulphate pulps are becoming well known and procedures based on those reactions can be briefly reviewed.

Available Unit Procedures

The following unit procedures are applied commercially in various combinations and sequences.

Chlorination

Of the impurities associated with the cellulose in unbleached pulps lignin is usually the most abundant. It can be removed with the aid of chlorination. Chlorine in water solution reacts with cellulose as well as with lignin but the difference in the rates is so great that the attack on the lignin can be made highly specific. Chlorination then, usually becomes one of the early steps in any sequence of purification procedures.

The chlorinated lignin products are to some degree soluble in water and more readily soluble in alkali. It seems reasonable to expect that the solubility will be increased if the size of the chlorinated lignin molecule can be reduced; and that apparently can be done by oxidation. At any rate it is found, in practice, that favorable results are obtained when an alkaline oxidation immediately follows the chlorination.

As unit procedures, therefore, there are two types of chlorination available. The first is the chlorination during which the pH falls rapidly with the addition of chlorine and remains at less than 2 or 2.5 throughout the reaction. The chlorinated pulp is washed without previous neutralization or, if neutralized, the alkali is added at the end of the reaction period as a means of protecting the washer from corrosion. For convenience this type may be termed the "all-acid" chlorination and designated by the symbol "C_a".

In the second type of chlorination a larger proportion of chlorine is added and allowed to react at a pH of less than 2 or 2.5 for a short period, usually not over 15 minutes, after which the pH is promptly

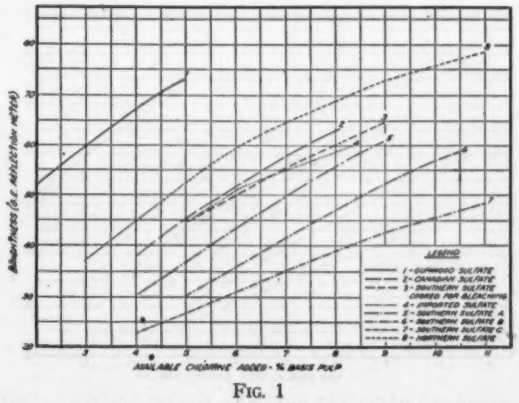

Fig. 1
Relation of Brightness to Available Chlorine Added in Single Stage Hypochlorite Bleaching of Several Sulphate Pulps

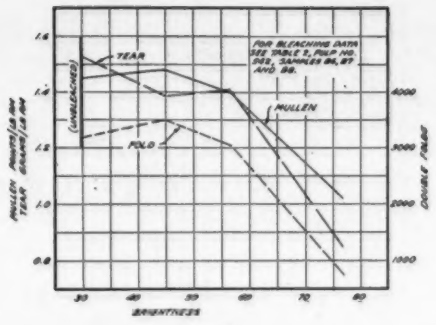

Fig. 2
Relation of Brightness to Strength at 300 cc Freeness for Single Stage Hypochlorite Procedure Applied to a Northern Coniferous Sulphate Pulp

shifted to a value greater than 8 and the reaction continues in a slightly alkaline medium for 60 to 90 minutes. The chlorinated products formed during the acid phase are subjected to a subsequent alkaline oxidation. This type may be termed "chlorination with alkaline oxidation phase" and designated "C."

Hot Caustic Extraction

In sulphate pulps there are dye-like substances which are not removed by direct chlorination nor is their color completely destroyed by the usual oxidation reactions in bleaching procedures. They can, however, be extracted by means of hot caustic soda under conditions of temperature and concentration that do not remove the hemicelluloses to an appreciable degree. The reaction can be fairly specific for the removal of those dyes and of such residues of chlorination as may not have been eliminated in previous operations. This reaction may be termed "hot caustic extraction" and designated "N".

Hypochlorite Bleach

Then there is the oxidation reaction which may under some circumstances be repeated one or more times in a sequence of purification procedures. Calcium hypochlorite is the reagent usually used and is the only one considered in this discussion. The hypochlorites react not only on the coloring matter and other impurities but also on the cellulose itself. The conditions of reaction must, therefore, be chosen with care if attack on the impurities is to be even reasonably selective. That reaction may be termed "hypochlorite bleach" and designated "B".

There are several other unit reactions of importance which may be used in sulphate bleaching procedures. They will be mentioned briefly but, for lack of time, cannot be considered in the discussion. Of special importance, particularly for bright pulps, is the reaction of SO_2 on the fully bleached pulps. Also important is the cold caustic extraction sometimes used to effect a more complete solution of the chlorinated lignin residues. Important too are the soaking periods usually provided as intermediates between two washing operations. The object of the soaking, which may be with water alone or water containing some agent to establish a preferred pH, is to permit diffusion of soluble impurities from the interior of the fiber walls to the surface and from the surface into the water. Extraction with a solution of SO_2 or cold caustic or even with water alone contribute toward a higher degree of purity of cellulose and therefore toward a brighter pulp and a pulp having a greater stability of brightness.

Combinations and Sequences of Procedures

In this study the following combinations and sequences of procedures are considered:

1. Single stage
   (a) "B" Hypochlorite
   (b) "C" "Chlorination with alkaline oxidation phase"
2. Two stages
   (a) "BB" Two hypochlorites
   (b) "C_aB" "All-acid" chlorination followed by hypochlorite
   (c) "CB" "Chlorination with alkaline oxidation phase" followed by hypochlorite
3. Three stages
   (a) "C_aBB" "All-acid" chlorination followed by two stages of hypochlorite
   (b) "CNB" "Chlorination with alkaline oxidation phase" followed successively by hot caustic extraction and hypochlorite
4. Four stages
   (a) "BCNB" Same as 3 (b) except preceded by a hypochlorite
   (b) "C_aBNB" Same as 3 (a) except with a hot caustic extraction between the hypochlorites
   (c) "CNBB" Same as 3 (b) except the hot caustic is followed by two rather than one hypochlorite
   (d) "CBNB" Same as 3 (b) except the hot caustic is preceded as well as followed by a hypochlorite

Other combinations or sequences suggest themselves but have been omitted for the reason that they do not fit into the desired program of the simultaneous production of three somewhat arbitrarily selected degrees of brightness. Those degrees of brightness are 55, 70, and 80.

Typical of kraft pulps of low semibleached brightness is the brightness of 55. Semibleached kraft pulps that seek to compete with unbleached sulphite are likely to have a brightness of 70. Bleached sulphites have a brightness ranging from about 78 to 90. Kraft, to compete with bleached sulphites must, therefore, have a brightness of at least 80. To compete with the better grades of sulphites it must have a brightness of at least 83 or 85.

To meet the objectives set up in this study the first stage or at least the first two stages must result in a brightness of at least 55. Furthermore, the first stage or two must form a suitable prerequisite to the further stages subsequently added to produce brighter shades.

Four series of procedures were arranged so that in each series the unbleached pulp could be bleached to 55 brightness, then by an additional stage to 70 and finally by the introduction of further stages to a brightness of 80. Those series are:

Series	To brightness →	55	70	80
I		"B"	"BB"	"BCNB"
II		"C_aB"	"C_aBB"	"C_aBNB"
III		"C"	"CB"	"CNB" or "CNBB"
IV		"C"	"CB"	"CBNB"

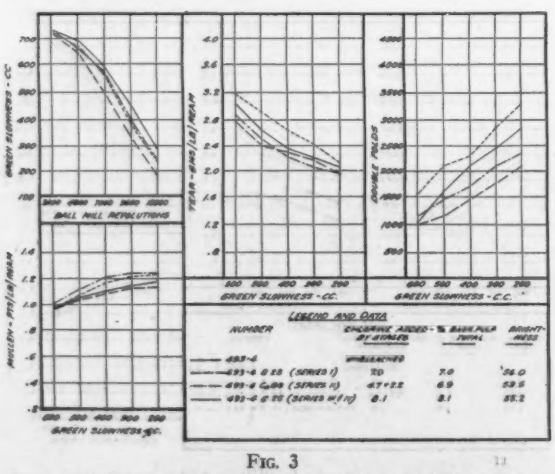

FIG. 3

Strength and Freeness of Southern Pine Sulphate Cooked for Bleaching when Bleached to 55 Brightness with Procedures of Series I, II, III, and IV

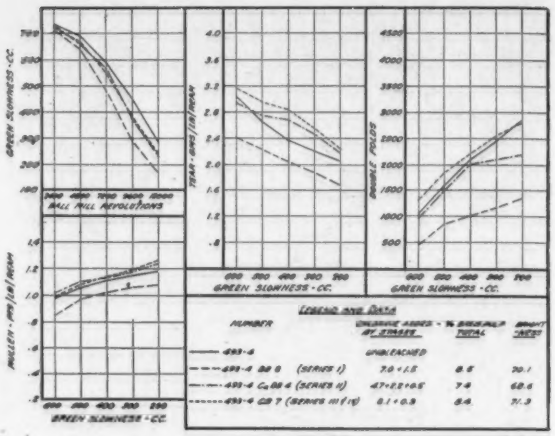

FIG. 4

Strength and Freeness of Southern Pine Sulphate Cooked for Bleaching when Bleached to 70 Brightness with Procedures of Series I, II, III, and IV.

Of those series the one which most fully meets with the stated objectives is Series IV. A bleachery laid out according to that procedure could withdraw at the end of the first stage, a portion of the pulp at a brightness of 55 and a further portion at 70 brightness at the end of the second stage. The remainder of the pulp could then be bleached to a brightness of 80 or higher. Any one of the four procedures lends itself to the design of a plant layout adapted to stepwise progressive installation. Assuming careful planning of the entire bleachery layout the cost of the stepwise development need not be appreciably greater than if the installation is made complete initially.

Experimental

The pulp used for these experiments is a southern pine sulphate specially cooked commercially for bleaching. It is typical of pulps used for making strong white products.

The details of the bleaching procedures as conducted in the laboratory tests and of the methods used for testing the quality of the pulps are described in the appendix. Experimental bleaching data are shown in Tables I and II and strength curves in Figs. 3, 4, 5, and 7.

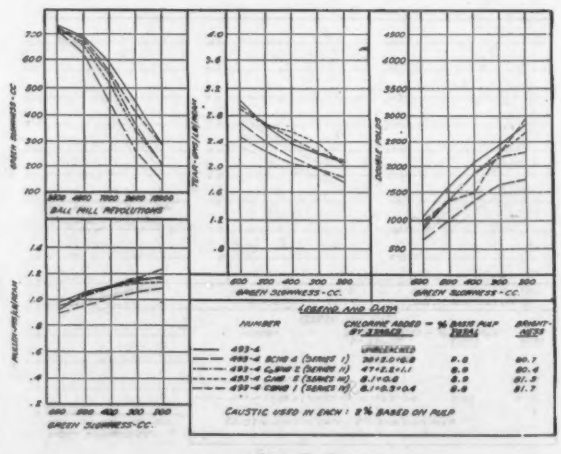

FIG. 5

Strength and Freeness of Southern Pine Sulphate Cooked for Bleaching when Bleached to 80 Brightness with Procedures of Series I, II, III, and IV.

SERIES I—"BCNB"

In Fig. 6, Curve B shows, for a single-stage hypochlorite bleach, the relation of brightness to available chlorine added. A brightness of 56 was obtained with 7.0% available chlorine.

When the pulp bleached with single-stage hypochlorite to a brightness of 56 was further bleached by a second hypochlorite a brightness of 70.1 was reached with approximately 8.5% total available chlorine. The same 56 brightness pulp further bleached to a brightness of 71 with a chlorination stage of the "C" type required 9.0% available chlorine.

The 71 brightness pulp ("BC") when further treated with a hot caustic-extraction stage followed by a hypochlorite ("BCNB") reached a brightness of 80.7 with the addition of 9.8% available chlorine.

SERIES II—"C_aBNB"

In Fig. 6, Curve "C_a" shows the relation of brightness to available chlorine added for an all-acid chlori-

TABLE I.—BLEACHING DATA

CHLORINATION STAGE ("C" or "C_a")—Consistency 3%, Temp. 25 deg. C. (± 2), lime (for "C" only) added at 5 minutes.
"HOT CAUSTIC EXTRACTION STAGE" ("N")—Consistency 5%, Temp. 60 deg. C. (± 3), period of extraction 60 minutes.
HYPOCHLORITE STAGE ("B")—Consistency 5%, Temp. 35 deg. C. (± 2), lime for pH control added part at the start and part during bleaching.
Chlorine, lime and caustic reported in per cent basis pulp unless otherwise indicated.

Number	Chlorination stage ("C" or "C_a") Chlorine Added %	Chlorine Consumed %	$Ca(OH)_2$ Added g/g cl_2	pH at end	Reaction period min.	Caustic stage ("N") NaOH added %	Hypochlorite stage ("B") Chlorine Added %	Chlorine Consumed %	$Ca(OH)_2$ Added g/g cl_2	pH Min.	Bleaching period min.	All stages Chlorine Added %	Chlorine Consumed %	$Ca(OH)_2$ ‡‡‡ Added %	Brightness, points
Southern Pine Sulphate Cooked for Bleaching (493-4)															
493-4							Unbleached pulp								22.9
SERIES I															
B 22	...	...	...	...	...	...	5.00	5.00	0.15	7.7	40	5.00	5.00	5.80	44.3
B 23	...	...	...	...	...	...	7.00	6.65	0.12	7.7	50	7.00	6.65	7.90	55.3
B 24	...	...	...	...	...	...	9.00	8.50	0.16	7.8	120	9.00	8.50	10.55	65.1
B 25	...	...	...	...	...	...	7.00	6.80	0.19	8.0	75	7.00	6.80	8.40	56.1
B 26	...	...	...	...	...	...	7.00	6.90	0.19	8.2	75	7.00	6.90	8.40	55.4
B 27	...	...	...	...	...	...	7.00	6.40	0.18	9.0	97	7.00	6.40	8.30	55.7
B 28	Blend of B 25, B 26 and B 27 (Data are weighted averages)								...	...	...	7.00	6.60	8.35	55.7
BB 9	...	...	...	...	...	...	7.00	6.60	(Portion of B 28)						
							0.20	0.18	0.56	7.9	60	7.20	6.78	8.65	60.0
BB 5	...	...	...	...	...	...	7.00	6.60	(Portion of B 28)						
							0.50	0.45	0.63	7.9	120	7.50	7.05	9.15	63.3
BB 6	...	...	...	...	...	...	7.00	6.60	(Portion of B 28)						
							0.90	0.85	0.50	7.9	215	7.90	7.45	9.70	67.7
BB 7	...	...	...	...	...	...	7.00	6.60	(Portion of B 28)						
							1.30	1.25	0.45	7.7	279	8.30	7.85	10.25	69.1
BB 8	...	...	...	...	...	...	7.00	6.60	(Portion of B 28)						
							1.50	1.05	0.24	8.2	240	8.50	7.65	10.20	70.1
BCNB 4	...	...	...	...	...	...	7.00	6.60	(Portion of B 28)						
	1.95	1.75	0.94	8.7	90	2.00	0.80	0.35	0.15	8.1	180	9.75	8.70	11.10	80.7*
SERIES II															
C_a 29	3.75	3.65	...	...	10	...	...	...	...	..	...	3.75	3.65	...	20.0
C_a 30	4.75	4.60	...	...	35	...	...	...	...	..	...	4.75	4.60	...	23.6
C_a 31	5.80	5.20	...	...	60	...	...	...	...	..	...	5.80	5.20	...	27.1
C_a 34	4.65	4.45	...	1.8	40	...	...	...	...	..	...	4.65	4.45	...	...
C_aB 4	4.65	4.45	(Portion of C_a34)			...	2.30	2.25	0.27	7.4	35	6.95	6.70	2.95	58.4
C_aB 5	4.65	4.45	(Portion of C_a34)			...	2.90	2.85	0.43	7.7	53	7.55	7.30	4.15	65.7
C_aB 6	4.65	4.45	(Portion of C_a34)			...	2.20	2.20	0.35	7.2	30	6.85	6.65	3.00	55.0
C_aB 7	4.65	4.45	(Portion of C_a34)			...	2.25	2.25	0.35	8.5	32	6.90	6.70	3.05	52.6
C_aB 8	Blend of C_aB 6, and C_aB 7 (Data are weighted averages)								...	...	...	6.90	6.70	3.05	53.4
C_aBB 1	(First two stages portion of C_aB 8)					...	0.10	0.10	0.53	8.8	15	7.00	6.80	3.20	61.1
C_aBB 2	(First two stages portion of C_aB 8)					...	0.30	0.30	0.35	8.1	62	7.20	7.00	3.45	67.6
C_aBB 3	(First two stages portion of C_aB 8)					...	0.50	0.45	0.47	8.4	135	7.40	7.15	3.80	71.2
C_aBB 4	(First two stages portion of C_aB 8)					...	0.50	0.45	0.45	8.1	120	7.40	7.15	3.75	68.6
C_aBNB 2	(First two stages portion of C_aB 8)					2.00	1.10	0.70	0.23	8.2	250	8.00	7.40	4.40	80.4
SERIES III															
C 22	7.85	7.85	1.04	8.8	79	...	...	...	...	..	...	7.85	7.85	8.20	55.4
C 24	7.90	7.90	1.04	8.7	90	...	...	...	...	..	...	7.90	7.90	8.15	56.4
C 23	8.05	8.05	1.06	8.6	90	...	...	...	...	..	...	8.05	8.05	8.55	56.9
C 21	8.35	8.20	1.03	8.0	90	...	...	...	...	..	...	8.35	8.20	8.60	59.7
C 20	8.85	8.55	1.02	7.9	90	...	...	...	...	..	...	8.85	8.55	9.00	61.5
C 25	Blend of C 21, C 22, C 23, and C 24 (Data are weighted averages)								...	..	...	8.05	8.00	...	57.1
CB 8	8.05	8.00	(Portion of C 25)			...	0.05	0.05	0.37	8.1	30	8.10	8.05	8.50	59.1
CB 4	8.05	8.00	(Portion of C 25)			...	0.20	0.20	0.28	7.6	95	8.25	8.20	8.70	68.5
CB 7	8.05	8.00	(Portion of C 25)			...	0.30	0.25	0.46	8.5	90	8.35	8.25	8.85	71.3
CB 5	8.05	8.00	(Portion of C 25)			...	0.60	0.55	0.46	7.7	190	8.65	8.55	9.30	74.1
CB 6	8.08	8.00	(Portion of C 25)			...	1.00	0.85	0.46	8.3	255	9.05	8.85	9.90	76.1
CNB 5	8.05	8.00	(Portion of C 25)			2.00	0.80	0.55	0.30	8.4	240	8.85	8.55	9.50	81.3
CNBB 1	8.05	8.00	(Portion of C 25)			2.00	0.40	0.30	0.17	8.2	120	...	...	...	**
							0.20	0.10	0.21	8.1	180	8.65	8.40	9.15	81.1
SERIES IV															
C 25A	8.05	8.00	(Portion of C 25)			...	...	...	...	..	...	8.05	8.00	...	57.1
CB 7A	8.05	8.00	(Portion of C 25)			...	0.30	0.25	0.17	8.5	75	8.35	8.25	8.70	71.3‡‡
CBNB 1	(First two stages portion of CB 7A)					2.00	0.40	0.20	0.21	8.1	180	8.75	8.45	9.25	81.7
Northern Coniferous Sulphate (542)															
542							Unbleached pulp								29.8
							4.00	4.00	0.17	8.3	23	4.00	4.00	4.70	44.7‡
B 6	...	...	...	..	..	...	5.50	5.45	0.19	8.2	60	5.50	5.45	6.55	56.4‡
B 7	...	...	...	..	..	...	11.00	10.35	0.19	7.5	240	11.00	10.35	13.15	77.0
B 8	...	...	...	..	..	...	4.00	4.00	0.16	8.5	24	...	...	...	†
BCB 5	...	...	...	..	..	...	1.00	0.60	0.28	8.4	90	7.95	7.35	8.95	76.8††

* Brightness at the end of second stage was 71.4.
** Brightness at end of third stage was 76.3.
† Brightness at the end of first stage was 45.6.
†† Brightness at the end of second stage was 61.0.
‡ Brightness was determined after three days.
‡‡ Brightness was not determined, but was assumed the same as CB 7 of which it was a duplicate.
‡‡‡ Includes lime used in making bleach liquor.

TABLE II.—SUMMARY OF BLEACHING AND TESTING DATA

Number	Series	Chemicals added basis pulp: Cl, %	Ca(OH)$_2$, %	NaOH, %	Brightness, points	Pulp loss due to bleaching*, Ash-free basis, %	Strength values at 300 cc. freeness ‡: Burst, pt./lb./rm.	Tear, g./lb./rm.	Double folds
Southern Pine Sulphate Cooked for Bleaching									
493-4			Unbleached pulp				1.15	2.21	2450
Approximately 55 brightness									
B	28	I	7.0	8.4	..	55.7	2.8	1.13	2.17	1750
C$_a$B	8	II	6.9	3.1	..	53.4	4.8	1.24	2.06	2100
C	25	III, IV	8.1	8.2	..	57.1	4.1	1.22	2.42	2850
Approximately 70 brightness									
BB	8	I	8.5	10.2	..	70.1	4.4	1.06	1.88	1150
C$_a$BB	4	II	7.4	3.8	..	68.6	5.5	1.17	2.46	2100
CB	7	III, IV	8.4	8.9	..	71.3	4.2	1.19	2.55	2550
Approximately 80 brightness									
BCNB	4	I	9.8	11.1	2.0	80.7	6.7	1.06	1.96	1650
C$_a$BNB	2	II	8.0	4.4	2.0	80.4	5.7	1.17	1.96	2200
CNB	5	III	8.9	9.5	2.0	81.3	5.7	1.13	2.38	2300
CNBB	1	III	8.7	9.2	2.0	81.1	..	1.17	2.27	1950
CBNB	1	IV	8.8	9.3	2.0	81.7	..	1.17	2.22	2300
Northern Coniferous Sulphate									
542			Unbleached pulp				1.45	1.53	3200
B	6	..	4.0	4.7	..	44.7†	..	1.48	1.39	3500
B	7	..	5.5	6.6	..	56.4†	..	1.40	1.41	3030
B	8	..	11.0	13.2	..	77.0	..	1.02	0.84	750
BCB	5	..	8.0	9.0	..	76.8	..	1.44	1.35	3050

† Readings were taken after three days.
‡ Green slowness tester used.
* These figures represent material actually dissolved.

nation. The effect of that chlorination was chiefly to remove lignin and only to a slight degree to brighten the pulp. A subsequent hypochlorite stage was required to reach a brightness of 53.4 with a total chlorine requirement of 6.9%. A further treatment with a hot caustic stage followed by a hypochlorite brought the brightness to 80.7 with a total of 8.0% available chlorine. For a brightness of 70 it is only necessary to reduce the proportion of hypochlorite used in the last stage, but a more economical procedure is to omit the hot caustic stage leaving the three stages "C$_a$BB". In the actual test the proportion of available chlorine used was insufficient to produce a brightness of 70 but 7.4% chlorine brought the brightness to 68.6 by that 3 stage operation.

Series III—"CNBB"

In Fig. 6, Curve "C" shows the relation of brightness to available chlorine added for a single-stage "chlorination with alkaline oxidation phase." The

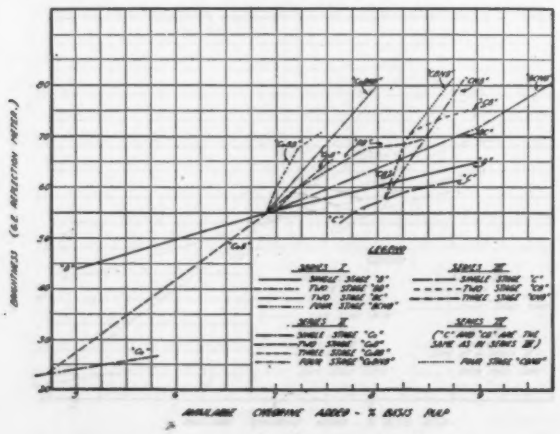

Fig. 6

Chlorine Requirements at Various Brightness Grades of Southern Pine Sulphate Cooked for Bleaching when Bleached with Procedures of Series I, II, III, and IV.

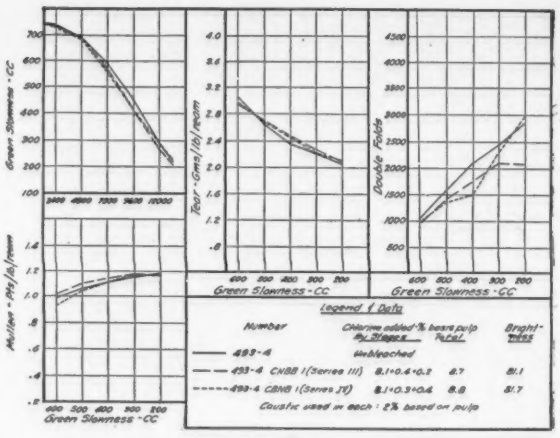

Fig. 7

Strength and Freeness of Southern Pine Sulphate Pulp Cooked for Bleaching when Bleached to 80 Brightness with Four Stage Procedure Having the "N" Stage in Two Different Positions

curve indicates that a brightness of 55 was obtained with the use of 7.8% available chlorine. A pulp brought to a brightness of 57.1 with 8.1% available chlorine was further treated with a hot caustic stage followed by a hypochlorite ("CNB"). A brightness of 81.3 was reached with 8.9% available chlorine. Here again a 70 brightness could have been attained by using less chlorine in the final stage but that brightness was more economically obtained by elimination of the caustic stage (see curve "CB") with only 8.3% available chlorine and no caustic.

In commercial operation conditions are not always favorable to the use of the mildest and simplest forms of bleaching. The character of the wood, the condition of digestion etc. may lead to rather hard bleaching pulps. In such cases two hypochlorite stages are desirable even for a brightness of 80 and are essential for a brightness much in excess of 80. For the pulp under study, however, when the final stage of the three-stage procedure ("CNB") was divided into two stages ("CNBB"), a brightness of 81.1 was obtained with 8.7% chlorine. The results as regards brightness, chlorine consumption and strength of product (*see* subsequent discussion) coincide so closely with the results obtained with three stages that the extra stage would be superfluous if ideal conditions always were assured.

Series IV—"CBNB"

In this series the first two stages are identical with those of Series III. A brightness of 57.1 was obtained with the first stage and 71.3 with the first two stages. The further treatment with a hot caustic stage followed by a hypochlorite brought the brightness to 81.7 with a total of 8.8% available chlorine (*see* curve "CBNB" in Fig. 6).

Comparison of the Procedures with Respect to Pulp Strength

Strength was determined for pulps bleached (a) by each of three procedures to a brightness of approximately 55, (b) three procedures to approximately 70, and (c) four procedures to approximately 80. The results are shown in Figs. 3, 4, and 5 and abstracted in Table II. For comparative purposes strength curves for the unbleached pulp are shown in each figure.

At 55 brightness the single-stage hypochlorite ("B") resulted in a distinct loss in strength, especially in folding endurance. The single-stage chlorination with alkaline oxidation phase ("C") produced a pulp superior to the unbleached in each element of strength. The two stages, all-acid chlorination and hypochlorite ("C_aB"), improved the burst but lowered the tear and fold.

The brightness was then raised to approximately 70 in each case by the addition of a hypochlorite stage. The pulp initially bleached with hypochlorite showed a further loss of strength indicating that the deterioration brought about in the first stage had left the cellulose more susceptible to degradation by a second hypochlorite. The pulp initially chlorinated with an alkaline oxidation phase still retained a strength superior to that of the unbleached. The pulp initially chlorinated all-acid was only slightly inferior to the pulp chlorinated by the other procedure, but required three rather than only two stages to attain the same brightness of approximately 70.

Of the pulps bleached to a brightness of 80 those initially chlorinated with an alkaline oxidation phase had a strength almost equal to that of the unbleached pulp. The pulp initially chlorinated all-acid, despite the one additional stage used, was slightly inferior to the unbleached pulp. The pulp of Series I indicated that the loss of strength, noted in the initial hypochlorite stage, still persisted through the four stages needed to obtain a brightness of 80.

Subsequent experiments with a northern pine, easy-bleaching sulphate pulp indicated that had the first hypochlorite of Series I ("BCNB") been carried to a lower brightness, say 46 instead of 55, the strength at that brightness would have fully equaled that of the unbleached. Even when two additional stages were added—chlorination with an alkaline oxidation phase and hypochlorite ("BCB")—the strength of the northern pulp at a brightness of 76.8 fell only slightly below that of the unbleached (*see* Fig. 8 and Table II). There is no reason to expect that the southern pulp would behave differently although opportunity to demonstrate it has been lacking. Even so the sequence of procedures would be valuable in producing grades of 45, 70, and 80 rather than 55, 70, and 80 brightness. It should be entirely practicable so to design a bleachery embodying this sequence that the order of sequence of the first two stages could be reversed as

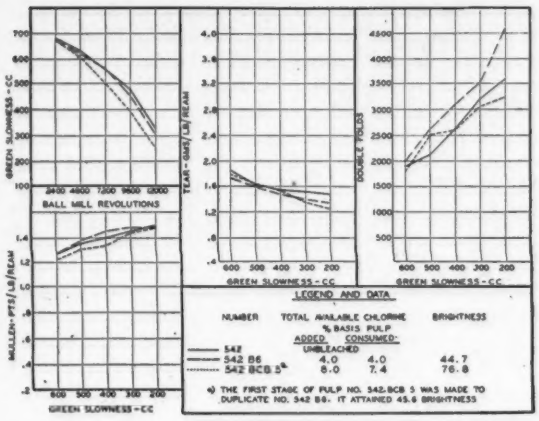
GREEN SLOWNESS - CC
BALL MILL REVOLUTIONS
MULLEN - PTS/LB/REAM
TEAR - GMS/LB/REAM
DOUBLE FOLDS
GREEN SLOWNESS - CC
LEGEND AND DATA
NUMBER
TOTAL AVAILABLE CHLORINE % BASIS PULP
ADDED
CONSUMED: UNBLEACHED
BRIGHTNESS
542
542 B6 4.0 4.0 44.7
542 BCB 5a 8.0 7.4 76.8
a) THE FIRST STAGE OF PULP NO. 542-BCB 5 WAS MADE TO DUPLICATE NO. 542 B6. IT ATTAINED 45.6 BRIGHTNESS

FIG. 8

Strength and Freeness of Northern Coniferous Sulphate when Bleached to 77 Brightness with Three Stage "BCB" Procedure, the First Stage of which Consists of "B" to 45 Brightness

the demand fluctuates between 45 and 55 brightness for the low semibleached portion of the product.

Position of the Hot Caustic Stage in the Sequence of Procedures

There has been considerable attention paid in the industry to the position in the sequence of procedures which the hot caustic stage should hold. In a multi-stage bleaching procedure in which the four basic stages are: chlorination with alkaline oxidation phase, hot caustic extraction, and two hypochlorites, the caustic stage may precede the two hypochlorites ("CNBB") or it may separate them ("CBNB"). Both sequences can be found in commercial operation.

The laboratory data, as shown in Fig. 7, indicate that as regards pulp strength and chemical requirements there is no advantage of one sequence over the other. Experience on a commercial scale, while not adapted to direct comparison of the two procedures, certainly indicates a confirmation of the laboratory results.

Comparison of the Procedures with Respect to Cost of Pulp and Chemicals

The cost of bleaching as well as the quality of the product is a vital factor in the evaluation of a bleaching procedure. It is recognized that a comprehensive

TABLE III.—COMPARATIVE COSTS PER TON OF BLEACHED PULP FOR PULP AND CHEMICALS REQUIRED IN BLEACHING SOUTHERN PINE SULPHATE COOKED FOR BLEACHING

Pulp bleached to brightness	55			70			80		
Bleaching procedure used (Series I / Series II / Series III)	"B"	"C_aB"	"C"	"BB"	"C_aBB"	"CB"	"BCNB"	"C_aBNB"	"CNB"
1. Unbleached pulp									
Approx. loss on bleaching, %	2.8	4.8	4.1	4.4	5.5	4.2	6.7	5.7	5.7
Required per ton bleached-tons	1.03	1.05	1.04	1.05	1.06	1.04	1.07	1.06	1.06
Cost per ton bleached at $25.00 per ton	$25.75	$26.25	$26.00	$26.25	$26.50	$26.00	$26.75	$26.50	$26.50
2. Chemicals									
Chlorine									
Lb. per 100 lb. unbleached	7.0	6.9	8.1	8.5	7.4	8.4	9.8	8.0	8.9
Lb. per ton bleached	144.0	145.0	168.5	178.5	157.0	174.5	209.5	169.5	186.5
Cost per ton bleached at 2.5c per lb.	$3.60	$3.63	$4.21	$4.46	$3.93	$4.36	$5.24	$4.24	$4.71
Lime †									
Lb. per 100 lb. unbleached	9.9	3.6	10.0	12.1	4.5	10.5	13.2	5.2	11.3
Lb. per ton bleached	204.0	75.5	208.0	253.0	95.5	218.0	282.5	110.0	239.5
Cost per ton bleached at 0.5c per lb.	$1.02	$.38	$1.04	$1.27	$.48	$1.09	$1.42	$.55	$1.20
Caustic soda									
Lb. per 100 lb. unbleached	.....	.....	.....	.....	.....	.....	2.0	2.0	2.0
Lb. per ton bleached	.....	.....	.....	.....	.....	.....	43.0	42.5	42.5
Cost per ton bleached at 2.5c per lb.	.....	.....	.....	.....	.....	.....	$1.08	$1.06	$1.06
Total Cost of Chemicals—per ton bleached	$4.62	$4.01	$5.25	$5.73	$4.41	$5.45	$7.74	$5.85	$6.97
3. Cost of chemicals and pulp—per ton bleached	$30.37	$30.26	$31.25	$31.98	$30.91	$31.45	$34.49	$32.35	$33.47

† Containing 84% "available" $Ca(OH)_2$.

comparison of the procedures cannot be made without considering such elements as capital invested and operating costs for such items as chemicals, power, labor, maintenance, etc. For the present discussions, however, it will be necessary to limit the cost elements to the chemicals required and to the loss in the weight of pulps.

Some difficulty was encountered in attempts to determine the proportion of the pulp that went into solution during the bleaching procedures. The figures for loss in weight therefore must be accepted as approximate.

The comparative costs for the first three series of procedures are shown in Table III.

Selection of a Procedure

Sulphate, more than any other grade of chemical wood pulp, presents a greater complexity of problems when it comes to the selection of a bleaching procedure. An intelligent selection presupposes answers to such questions as:

(a) What degree of brightness is required?
(b) Will it be necessary to make more than one brightness grade at the same time?
(c) To what extent will the future call for brighter grades?
(d) Is strength or economy of production the paramount issue?
(e) To what extent must capital investment be limited?

Low Semibleach

For low semibleached shades, say 40 to 50, a single hypochlorite bleach is to be preferred. Cost of operation is relatively low, strength of pulp equals or surpasses that of the unbleached, and capital investment under some circumstances may be almost negligible. For example, the bleaching can be done successfully in beaters and the pulp used without being washed. The penalty is an increase in the consumption of alum and some foaming but capital investment may be as low as $10,000 for a capacity of 100 tons per 25 hours. Where fully recommended facilities are used the cost will be correspondingly higher.

Bright Semibleach

A bright semibleach, say to 65 to 70 brightness, would be desired for such grades as may be required for use in competition with unbleached sulphite. It may be assumed that in most cases the specifications will call for maximum strength of product, minimum capital investment and maximum adaptability to extension of the procedure for a later production of brighter shades.

In that case the preferred procedure would seem to be the two stages: chlorination with alkaline oxidation phase followed by a hypochlorite stage ("CB"). It insures maximum strength of product with the lowest capital investment in that quality range. By the addition of a hot caustic stage followed by a second hypochlorite any brightness within the range from unbleached shades to 85 or over can be obtained provided, of course, a suitable grade of unbleached is made available to the bleachery.

Where the ultimate in strength is not imperative and where maximum economy in operation is more important than maximum strength it may be desirable to use a three-stage precedure: all-acid chlorination followed by two hypochlorite stages ("C_aBB"). It is beyond the scope of this paper to determine to what extent the saving of a dollar in chemicals will be offset by the higher overhead, cost of maintenance, power, pulp shrinkage, etc.

The three-stage procedure ("C_aBB") also can be expanded for the production of brighter grades. The insertion of a hot caustic stage between the two hypochlorite stages is sufficient for the production of brightness grades up to about 85.

Full Bleach

In some cases a maximum brightness of 80 may be considered full bleach. In those cases the choice would lie between the three-stage procedure, "CNB," and the four-stage procedure, "C_aBNB". The discussions regarding the relative merits of the "CB" and "C_aBB" procedures applied equally well here.

The laboratory results indicate that it is practicable to obtain with the procedures cited and applied to the pulp under study, a strong pulp at a brightness of 80. It may be well to emphasize, however, that those procedures may not, under commercial conditions and with all grades of pulps, give the favorable results obtained in the laboratory experiments. For commercial use even for a maximum brightness of 80 one additional hypochlorite stage is recommended for each of the two procedures. The choice could then be made between three procedures (1) "CNBB" (2) "CBNB," and (3) "C_aBNBB".

Procedures 1 and 2 would be less costly to install and may be expected to yield a slightly stronger pulp than Procedure 3. Also, except for chemical requirements, operating costs would probably be lower. The chemical requirements would, however, be higher.

Procedures 1, 2, and 3 also are suitable for a brightness considerably in excess of 80. In that case, and in fact, in all cases of full bleaching, the four or five basic stages should be supplemented by double washing of the caustic and final hypochlorite-stage pulps. There should be a soaking period between the two washes and in the latter case the pH should be adjusted preferably with SO_2. Discussions of details concerning the supplementary stages are beyond the scope of this paper.

APPENDIX

Preparation of Pulps for Bleaching and Testing

For each of the two unbleached pulps, 493-4 and 542, a representative portion of the shipment was defibered in laboratory equipment and thickened to approximately 25% consistency. After thorough mixing the pulp was divided into equal batches of approximately 400 grams. At the same time a representative portion was taken for determination of moisture-free pulp content and for strength tests and placed in a jar having an airtight cover. TAPPI Standard T 208 m (toluene method) was used to determine the moisture-free content of all pulps used for bleaching and testing. The several weighed batches of pulp were stored in paper bags.

Description of Bleaching Procedures

All acid chlorination ("C_a")

Consistency 3%, temperature 25 deg. C. (±2), duration not over 60 minutes. The computed amounts of chlorine water and diluting water were first mixed and the available chlorine content of the mixture was determined. The pulp was then stirred into the diluted chlorine water. pH and available chlorine were determined at intervals during the reaction and at the end. The pulp was finally washed and thickened.

Chlorination with Alkaline Oxidation Phase ("C")

Consistency 3%, temperature 25 deg. C. (± 2), total duration not over 90 minutes. At the start the

pulp was added to the diluted chlorine water in the same manner as in the "C_a" stage. At the end of five minutes sufficient milk of lime was stirred into the reaction mixture so that the pH remained above 8 for the remainder of the stage. pH and available chlorine were determined at intervals and at the end. The pulp was finally washed and thickened.

HYPOCHLORITE ("B")

Consistency 5%, temperature 35 deg. C. (±2), duration not over 280 minutes. At the start the clear bleach liquor was added to the pulp suspension. In order to control the pH, milk of lime was added; part of it at the start and part of it during the bleaching. pH and available chlorine were determined at intervals and at the end. The pulp was finally washed and thickened.

HOT CAUSTIC EXTRACTION ("N")

Consistency 5%, temperature 60 deg. C. (±3), duration 60 minutes. At the start 2% NaOH based on the pulp was stirred into the suspension. This dosage was sufficient to maintain the pH above 11 during the stage. At the end the pulp was washed and thickened.

WASHING AND THICKENING

The washing consisted of three dilutions with tap water to approximately 0.25% consistence each followed by a drainage on a 200-mesh screen. After the third wash the pulp was pressed until the pulp content was 25 to 30%.

The bleached samples for strength determination were stored in jars having airtight covers.

Preparation of Chemicals

The *chlorine water* was prepared by bubbling chlorine gas through tap water. The usual concentration was 4 to 6 grams per liter available chlorine.

The *bleach liquor* was prepared by bubbling chlorine gas through milk of lime until nearly neutral. To insure saturation with free alkali, excess lime was added. The concentration of the clear, settled and decanted liquor was 30 to 35 grams per liter available chlorine.

An acceptable grade of commercial slaked *lime*, containing 84.2% $Ca(OH)_2$, was used. The lime milk, which was added to the pulp suspension during the chlorination or hypochlorite stages, was screened through a 100-mesh wire cloth.

Commercial "rayon grade" *caustic soda* was diluted to approximately 2% before addition to the pulp suspension in the extraction stage.

Testing of Chemicals

The determination for *available chlorine* was made by titration of liberated iodine with sodium thiosulphate.

The hydrogen ion concentration was determined by means of an electrometer, having glass and calomel electrodes.

Pulp Testing Methods

PREPARATION OF TEST SHEETS FOR BRIGHTNESS DETERMINATION

Sheets for brightness tests were made from the pulps not more than four hours after the completion of the final bleaching and washing operations. Sufficient pulp was used so that the sheets weighed 80 to 100 pounds per ream (24 x 36—500). Distilled water was used for diluting the pulp in the deckle box. Before couching, a sheet of hardened filter paper was laid on the wet sheet. The sheet with the filter paper still in contact was pressed for two minutes between felts at 200 p.s.i. pressure and then placed between new blotters and rolled up in a blotter roll. Drying was accomplished by blowing a strong current of air through the roll for approximately sixteen hours.

PREPARATION OF TEST SHEETS FOR STRENGTH DETERMINATION

Strength test sheets, which were prepared at intervals from the pulp being processed in the pebble mill, were made to weigh approximately 37 pounds per ream (24 x 36—500). Tap water was used for dilution and felts alone were used for couching; the sheets were pressed for two minutes between felts at 900 p.s.i. pressure, and they were dried for two minutes between blotters on a steam hot plate.

BRIGHTNESS DETERMINATION

Brightness tests were made on the sheets after removing the filter paper. The readings were made on the filter paper side of the sheet. The results as they appear in the tables and figures represent in each case the average of three readings. For each pulp the deviation was not more than one point.

BALL MILLING

The pulps which were subjected to strength tests were processed in a pebble mill (Abbe) at 3% consistency using the Miller continuous procedure.

FREENESS

Freeness tests were made, using a Green slowness tester, with the pulp adjusted to 0.3% consistency at 20 deg. C.

CONDITIONING TEST SHEETS

Test sheets were conditioned at 70 deg. C. (±2) and 65% (±2) relative humidity.

PULP LOSS DUE TO BLEACHING

Yield determinations were made using approximately 3.5-gram samples of pulp, processed to duplicate certain of the large scale bleaching tests. Samples of the thoroughly agitated pulp at 0.18% consistency were siphoned into tared bottles and weighed to the nearest gram. They were then thickened for determination of consistency and for bleaching. Washing was conducted in a Buchner funnel made with a fritted glass disk; thickening was conducted in a porcelain Buchner funnel into which was fitted a disk of ashless filter paper.

The pulps after their various treatments were dried on a steam hot plate with the lid up and then were brought to constant weight by further drying in the oven at 105 deg. C. (±3). The results as they appear in Table III are expressed as per cent loss of pulp due to bleaching, corrected for ash. The maximum deviation in consistency for four unbleached samples corrected for ash was 0.0018%; the maximum deviation in duplicate tests for pulp losses, also corrected for ash, was 1.6%.

ASH

The pulp samples were ashed in tared porcelain crucibles in a muffle furnace and the ash was brought to constant weight by repeated heatings. The maximum deviation in ash content of duplicate tests was 0.29%.

Hooker Electrochemical Co. Join TAPPI

The Hooker Electrochemical Company has become a sustaining member of the Technical Association of the Pulp and Paper Industry. For many years the Hooker Company has, through its fine technical organization, engaged in research and has given the industry the benefit of its findings through the Technical Association. John D. Rue has been chairman of the Advisory Subcommittee of the TAPPI Pulp Purification Committee for several years.

The Hooker Electrochemical Company, with its main office at Niagara Falls, New York and plants at Niagara Falls and Tacoma, Washington, has long been one of the large electrolytic caustic soda and chlorine producers of the country. The original plant at Niagara Falls was started in 1906 while the Tacoma plant was put into operation in 1929. Expansion of plants and products has gone forward steadily until now about eighty products are regularly manufactured. These are mostly derivatives of chlorine and are both inorganic and organic compounds. The inorganic chemicals include anhydrous aluminum, antimony and arsenic trichlorides, bleaching powder, muriatic acid, sulphur chlorides, sulphuryl chloride, and thionyl chloride. The organic chemicals are more numerous and some important ones are benzoate of soda, benzoic acid, benzoyl chloride, benzyl chloride, chlorinated paraffin, chlor naphthalene, hexachlor benzene, lauryl pyridinim chloride, meta nitro benzoyl chloride, methyl dichlor stearate, monochlor benzene, monochlor toluene, orthodichlor benzene, paradichlor benzene, para nitro benzoyl chloride, phosgene, and trichlor benzene.

Two important derivatives of caustic soda are sodium sulphide and sulphhydrate. Because of new and novel methods of manufacture, these chemicals are of unusual purity and are finding new uses and applications. The leather industry has adopted sodium sulphhydrate as the preferred material for removing hair from hides.

Because the heart of its business is its installation of electrolytic cells, the Hooker Company has carried on an active program of research to improve cell design in order to provide greater efficiency and to increase the production capacity. This has resulted in the development of the Hooker Type S Cell which has been accepted by the industry as one of the outstanding electrolytic cells for the production of chlorine and caustic alkalies. These are installed in several industrial and government-owned plants as well as in some pulp and paper plants for the production of their own requirements of caustic and chlorine.

The pulp and paper industry has always been one of the principal consumers of chlorine. For this reason, the Hooker Company has maintained a laboratory to render service to this industry. The staff of experts of this laboratory has developed new methods of bleaching pulp which have introduced new criteria of the strength of papers of high colors. These methods of bleaching have also brought about economies in the use of chlorine and other chemicals. Engineering service has been given in the development of equipment and controls for these improved bleaching processes. The Hooker Company continues to give assistance which is helping the industry to meet the problems of the present emergency.

TAPPI Assists the Quartermaster

About 140 representatives of the paper and container industries met on June 4 at the Stevens Hotel, Chicago, Ill., under the sponsorship of the Technical Association of the Pulp and Paper Industry to discuss current packaging problems with Major Charles G. Herman of the U. S. Quartermaster Corps, Subsistence Research Laboratory.

R. G. Macdonald, Secretary of TAPPI presided and pointed out the need at the present time for all branches of the industry to give the benefit of their experience and ideas to those directly engaged in the war effect.

Major Herman outlined the needs of the armed forces with regard to the packaging of perishable food products. To assist in this work he called upon qualified papermill and related industries' laboratories to cooperate with the Laboratory in carrying on packaging tests under temperature and humidity conditions prevailing in locations where such packages will be sent for field use.

The entire day was devoted to a full and enthusiastic discussion of the general subject of packaging dehydrated foods and the desirable testing procedure to evaluate such containers. The returns from a questionnaire filled out by those attending the conference indicated that there would be ample cooperative work done by well qualified plant laboratories.

Among those who registered at the meeting were the following:

Dale Addington, R. S. Apple, L. W. Armstrong, Lloyd Arnold, M. D., Edward B. Babel, Parker K. Baird, P. S. Barnhart, R. M. Bates, Daniel Belcher, Robert M. Bergstein, Harry J. Bettendorf, R. P. Bigger, D. E. Black, Charles V. Brady, C. R. Breden, Carl L. Brickman, G. J. Brabender, Rex Bradt, Thomas J. Burke, S. W. Campbell, Thomas F. Cass, Jr., C. H. Champion, Frederic H. Cherepow, K. G. Chesley, C. M. Connor, Cecil F. Dawson, R. C. Denton, G. F. Des Autels, M. L. Downs, Harry C. Fisher, Harry Foss, Karl W. Fries, H. J. Geibel, William Geisler, A. J. Gerharz, Erwin O. Goll, W. H. Graebner, J. E. Greenslade, D. O. Guth, Richard F. Hahn, R. D. Halford, John F. Halladay, John B. Hanna, Carl H. Hartman, Major Charles G. Herman, C. W. Hoffman, L. G. Horvath, C. E. Hrubesky, H. B. Ingersoll, Michigan Carton Company, W. K. Jackson, L. S. Johnson, Arthur E. Jones, W. F. Kallock, L. V. Keefe, Helen U. Kiely, K. E. Kretlow, M. A. Krimmel, G. T. Latham, A. R. Lillie, C. E. Lindgren, Heinz H. Loeffler, F. D. Long, J. L. Lyons, R. G. Macdonald, D. G. Magill, Walter S. Maier, J. D. Malcolmson, P. J. Morales, William T. Muehlberg, E. J. Mulholland, W. J. Muller, David W. Murphy, W. J. Mutschler, A. R. Penfield, Robert O. Ragan, William T. Rehling, C. M. Rhodes, Raymond C. Rietz, Clifford R. Rowe, J. A. Schaeffler, G. R. Sears, A. Vernon Shannon, Walter V. Shearer, George H. Sheets, Clement H. Shelley, H. C. Speel, Frederick L. Spencer, Henry W. Stevens, B. M. Thomas, R. W. Kenneth Ulm, Paul Walker, Fred A. Weymouth, Mesle R. Wilkins and W. A. Wylde.

Warren Declares Dividend

Boston, Mass., June 8, 1942—The S. D. Warren Company has declared a quarterly dividend of 75 cents, payable June 26 to stockholders of record June 18.

IMPORTS OF PAPER

NEW YORK IMPORTS

WEEK ENDING JUNE 6, 1942

SUMMARY

Newsprint ..... 1030 rolls
Tracing paper ..... 1 cs.

NEWSPRINT

——, ——, ——, 326 rolls.
——, ——, ——, 374 rolls.
——, ——, ——, 330 rolls.

TRACING PAPER

Saentis, Inc., ——, ——, 1 cs.

RAGS, BAGGINGS, ETC.

——, ——, ——, 1935 bls. cotton linters.
——, ——, ——, 3793 bls. cotton linters.
——, ——, ——, 3033 bls. cotton linters.

GLUESTOCK, ETC.

H. Remus, ——, ——, 120 bls. gluestock.
——, ——, —— 335 bls. gluestock.
——, ——, ——, 400 bags bone glue.
Public National Bank Trust Co., ——, ——, 100 bags skin glue.
Bank of London & South America, ——, ——, 100 bags sheet glue, 100 bags bone glue, 400 bags animal glue.
Hafleigh & Co., ——, ——, 403 bags bones.
Baugh & Sons, ——, ——, 11866 bags bones.
——, ——, ——, 9738 bags bones.

Government Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 10, 1942—The Government Printing Office has received the following bids for 200,000 pounds of 19 x 24 white blotting paper: Whitaker Paper Company, 7.68 cents; Walker Goulard Plehn Company, Inc., 8.72 cents; R. P. Andrews Paper Company, 7.4 cents; Mudge Paper Company, 7.27 cents; Cauthorne Paper Company, Inc., 7.184 cents; and Mathers-Lamm Paper Company, 7.131 cents.

For 187,000 pounds of 32 x 42 white sulphite writing paper: R. P. Andrews Paper Company, 7.14 cents; Barton, Duer & Koch Paper Company, 7.27 cents; Paper Corp. of U. S., 7.23 cents; Marquette Paper Company, 7 cents; Stanford Paper Company, 7.989 cents; Whitaker Paper Company, 7.12 cents; Wilcox Walter Furlong Paper Company, 7.8 cents; Central Ohio Paper Company, 7.43 cents; Cauthorne Paper Company, 7.98 cents; Parker Young Company, 7.497 cents; Mead Sales Company, 7.19 cents; Walker Goulard Plehn Company, 8.46 cents; Perkins-Goodwin Company, 7.12 cents; D. L. Ward & Co., 7.43 cents; Bradner Smith & Co., 7.67 cents; Coy-Hunt & Co., 7.22 cents; Tobey Fine Paper, Inc., 7.24 cents; Bermingham & Prosser Company, 7.18 cents; and Butler Company, 7.2 cents.

For 80,000 pounds of supercalendered book paper in 28½ inch rolls: Perkins-Goodwin Company, 5.44 cents; R. P. Andrews Paper Company, 5.38 cents; Stanford Paper Company, 5.83 cents; Marquette Paper Company, 5.63 cents; Butler Company, 6.17 cents; Mudge Paper Company, 5.26 cents; Paper Corp. of U. S., 5.79 cents; Barton Duer & Koch Paper Company, 3.85 cents; Coy Hunt & Company, 6.36 cents; Wilcox Walter Furlong Paper Company, 6.7 cents; Bradner Smith & Co., 6.3 cents; and Bermingham & Prosser Company, 6.36 cents.

For 4,340 pounds of 50% rag, 30 x 34 green manifold: Barton Duer & Koch Paper Company, 20 cents; R. P. Andrews Paper Company, 20.95 cents; Old Dominion Paper Company, 22.47 cents; Walker Goulard Plehn Company, 19.49 cents; Paper Corp. of U. S., 20.74 cents; Whitaker Paper Company, 20 cents; Bradner Smith & Company, 10.64 cents; and Stanford Paper Company, 20 cents.

For 40,000 pounds of yellow sulphite writing paper in 32 inch rolls: R. P. Andrews Paper Company, 7.39 cents; Mudge Paper Company, 7.17 cents; Paper Corp. of U. S., 8.05 cents; Marquette Paper Company, 8.1 cents; Stanford Paper Company, 8.7436 cents; Whitaker Paper Company, 7.75 cents; Eastern Corporation, 8.7 cents; Wilcox Furlong Paper Company, 7.95 cents; Cauthorne Paper Company, 7.92 cents; Mathers-Lamm Paper Company, 8.35 cents; Central Ohio Paper Company, 7.3 cents; Butler Company, 7.99 cents; Marathon Paper Mills Company, 9.4 cents; North American Pulp and Paper Corporation, 8.5 cents; Walker Goulard Plehn Company, 7.73 cents; Bermingham & Prosser Company, 7.9 cents; and W. L. Ward & Co., 8.45 cents.

For 150,000 pounds of white sulphite writing paper in 38 inch rolls: Barton, Duer & Koch Paper Company, 5.62 cents; R. P. Andrews Paper Company, 5.24 cents; Paper Corp. of U. S., 5.74 cents; Marquette Paper Company, 5.85 cents; Stanford Paper Company, 5.7488 cents; Whitaker Paper Company, 5.36 cents; Cauthorne Paper Company, 6.46 cents; Mathers-Lamm Paper Company, 7.6 cents; Mead Sales Company, 6.29 cents; Central Ohio Paper Company, 6.71 cents; Butler Company, 6.63 cents; Parker Young Company, 6.272 cents; Watervliet Paper Company, 6.34 cents; Marathon Paper Mills Company, 7.65 cents; Perkins Goodwin Company, 5.63 cents; North American Pulp & Paper Company, 7.25 cents; Walker Goulard Plehn Company, 5.74 cents; Bermingham & Prosser Company, 6.07 cents; D. L. Ward & Co., 6.97 cents; and Buckley Dunton & Co., 5.29 cents.

For 53,760 pounds of 38 x 48 supercalendered book paper: Perkins-Goodwin Company, 5.57 cents; Bermingham & Prosser Company, 5.54 cents; R. P. Andrews Paper Company, 5.47 cents; Mudge Paper Company, 5.54 cents; Frank Parsons Paper Company, 5.83 cents.

For 413,000 pounds of white supercalendered printing paper in 30 inch rolls: Marquette Paper Company, 5.225 cents; Stanford Paper Company, 5.04 cents; and Mudge Paper Company, 5.26 cents.

For 53,025 pounds of 31½ x 48 yellow sulphite writing paper: Paper Corp. of U. S., 8.45 cents; Mudge Paper Company, 10 cents; Marquette Paper Company, 8.43 cents; and R. P. Andrews Paper Company, 7.42 cents.

Coast Mills Sign Wage Increase

PORTLAND, Ore., June 8, 1942—A wage increase agreement between thirty-three Pacific Coast pulp and paper mills and two A. F. of L. unions was approved by a vote of more than 5 to 1, John Sherman, vice-president of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, said today.

The agreement sets the basic pay of employees of one year or more at 83 cents an hour, a 10 cent increase, and of those of six months or less experience at 82½ cents, a 7½ cent increase.

Russell T. Drummond, Stockton, Cal., vice-president of the International Brotherhood of Papermakers, said the paper industry was the only major operation in the country to have settled its differences by conferences without calling in Federal agencies.

New York Paper and Pulp Market Review

General Demand For Paper Less Active This Week—Tight Situation Reported In Book and Bond Grades of Bleached Sulphite Pulp —Paper Stock Market Unsettled By Oversupply In Lower Grades.

Office of the PAPER TRADE JOURNAL.
Wednesday, June 10, 1942.

The wholesale paper market is less active this week as the decline in general business activity continues in civilian consumption. Purchasing by the government agencies continues very heavy. The restrictions placed on the free flow of practically all kinds of materials and finished products, excepting foods, in furtherance of the war effort, has caused a greater decline in general business than had been expected. It may yet be too early to draw conclusions as to the severity of the decline in normal trade, but there is little doubt but that a much more substantial decline is likely to occur in the second half of the current year.

The index of general business activity declined to 132.0% for the week ended May 30, from 132.3% for the preceding week, compared with 129.4% for the corresponding week last year. Paper board output was 7.0% lower.

Paper production for the week ended May 30 was estimated at 92.3%, compared with 96.8% for 1941, with 87.6% for 1940, with 74.2% for 1939, and with 62.5% for the corresponding week for 1938.

Paper board production for the week ended May 30 was 77.0%, compared with 84.0% for 1941, with 75.0% for 1940, with 57.0% for 1939, and with 48.0% for the corresponding week for 1938.

The Office of Price Adjustment has ruled that prices for new specialty board items must be submitted and approved by that agency. This includes proposed prices at which the products are to be sold. It is also clear that proposed prices must be approved by the OPA for paper board not sold, not contracted for sale, nor for which a price was listed by the manufacturer during the base period adopted, that of October 1-15, 1941.

Wood Pulp

The War Production Board, Informative Bulletin No. 11, May 28, 1942, states that the analysis of the figures provided by the forms filed under General Preference Order M-93 for June, indicates a tight situation exists in the book and bond grades of bleached sulphite pulp, some difficulties in strong unbleached sulphite, and in the paper grades of unbleached sulphate. The supply of the news grade of unbleached sulphite is stated to be ample.

The WPB calls attention to the expiration of the 60-day limitation of pulp inventories, which ended April 30, 1942. It states that the building up of inventories of wood pulp by consumers is timely in view of impending transportation difficulties. All pulp producers are asked to inform customers that orders for pulp on Form PD-290, should be made up for tonnages which will permit maximum car loadings.

Rags

Demand for the higher grades of cotton cuttings is reported fair at this date. Trading in mixed rags is also fair. Mill buying of the roofing grades is active, with most reports indicating full maximum prices are being paid.

Old Rope and Bagging

Mill buying of old No. 1 Manila rope continues to absorb all limited supplies available. Reports also indicate that the OPA maximum price of $115 per ton is generally maintained.

Scrap bagging prices are reported to be well maintained at this date, although trading is a little slow. Roofing bagging, however, is quite active and the maximum price of $1.25 is generally well maintained.

Old Waste Paper

The decline in mill buying of the lower grades of waste paper is reported continuing at this date. Some reports indicate that new contracts for waste paper collections, between large consumers of paper, including office building collections, will be made this month for the second half of the year, at lower prices. The paper stock market in the lower grades is soft.

Twine

Manufacturers of soft fiber twines report that they are now permitted to produce for civilian use, during the month of June, 30% and for July, 1942, only 25% of their average monthly shipments in 1941. All orders for jute twines must carry ratings of A-10 or higher.

Verne Williams Leaves Lee Paper Co.

VICKSBURG, Mich., June 8, 1942—W. Verne Williams, sales manager for the Lee Paper Company for the past nine years, has resigned from that position as of June 8. Prior to his connection with the Lee Paper Company, Mr. Williams had been associated with the Howard Paper Company, of Urbana, Ohio; the Beckett Paper Company, of Hamilton, Ohio; and the Graham Paper Company, of St. Louis. He has had a broad experience and has a host of friends in the paper trade. His future plans have not been announced but with him go the best wishes of his many friends for his continued success.

Factory Committees Aid

ALBANY, N. Y., June 1, 1942—Factory committees in the industries of this section have rounded up 522,146 pounds of salvage material which has been turned over to dealers for aiding the war effort. Included in the gathering was 68,528 pounds of waste paper. Seventeen firms, including many prominent paper mills, are represented in the reports which are being made weekly to the local Chamber of Commerce.

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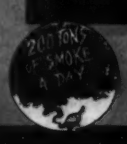

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41 East 42nd St., New York, N. Y.

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, June 10, 1942.

BLANC FIXE—Prices on blanc fixe are firm and unchanged and conform to prevailing market levels. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is currently quoted at $60 per ton, f.o.b., works. Demand reported good for the week.

BLEACHING POWDER—Quotations on bleaching powder are firm. Demand reported good for the week. Bleaching powder is currently quoted at $2.25 per 100 pounds, in drums, at works.

CASEIN—Prices on casein are lower for the current week. Standard domestic casein, 20-30 mesh, is currently quoted at 17¾ cents per pound; 80-100 mesh, at 18¼ cents per pound. All prices in bags, car lots. Argentina casein, 20-30 mesh, is currently offered at 15¾ cents per pound, c.i.f. No quotations on French casein.

CAUSTIC SODA—Quotations on caustic soda are firm and continue unchanged at prevailing market prices. Demand reported good. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds, in drums, car lots, at works.

CHINA CLAY—Prices on china clay are firm and conform to prevailing market levels. Demand reported moderate at this date. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay at from $12 to $22 per ton, at mines. Imported clay is currently offered at from $13 to $25 per long ton, ship side.

CHLORINE—Quotations on chlorine are firm and unchanged. Market strong. Government demand is reported very heavy during the current week. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported firm for the week with varying prices on some grades. "G" gum rosin is currently quoted at $2.85 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $2.72 per 100 pounds, in barrels, New York. Seventy per cent gum rosin size is quoted at $3.24 per 100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm. Demand good for the current week. Domestic salt cake is currently quoted at $15 per ton, in bulk; chrome salt cake at $16 per ton . All prices in car lots, f.o.b., shipping point. The quotation of $16 per ton imported salt cake is nominal.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market levels. Demand reported good for the week. Prices on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are firm and are reported unchanged for the current week. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds. All prices in bags, car lots, f.o.b, Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina. Demand reported moderate for the current week. The commercial grades are currently quoted at from $1.15 to $1.25; iron free at from $1.75 to $1.85 per 100 pounds. All prices in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and conform to prevailing market levels. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $18 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, at mines. No quotations on imported talc.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Carload Quantities			
* Delivered Prices			
Extra Quality	$6.00	@	$7.00
Superstandard	5.25	"	6.25
* No. 1 Wrapping	5.00	"	—
* Standard Bag	4.37½	"	—
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.05	"	—
White No. 1½	1.00	"	—
White No. 2	1.00	"	—
Anti-Tarnish M. G.	.95	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.35	"	—
Bleached, Jr.	2.65	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	5.50	"	5.75
No. 2 Manila Wrapping, 35 lb.	5.25	"	5.50
Boards, per ton—			
News	*48.00	@	—
Chip	*45.00	"	—
Sgl. Mla. Ll. Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*60.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers
100% Rag Ext. No. 1	$40.25 @ $47.25		$41.40 @ $48.50
100% Rag	32.20 " 37.75		33.35 " 39.25
85% Rag	.... "		32.20 " 37.75
75% Rag	24.75 " 29.00		25.90 " 30.50
65% Rag	.... "		22.80 " 27.75
50% Rag	18.70 " 22.75		19.90 " 24.25
25% Rag	16.40 " 20.00		17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55 @ $12.75	$11.70 @ $14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper.

Delivered in Zone 1:

No. 1 Glossy Coated	$13.65	@	$15.50
No. 2 Glossy Coated	12.40	"	14.00
No. 3 Glossy Coated	11.60	"	13.25
No. 4 Glossy Coated	11.15	"	12.75
No. 1 Antique (watermarked)	10.25	"	11.75
No. 2 Offset	9.60	"	11.00
A Grade E. F.	9.35	"	10.75
A Grade S. & S. C.	9.60	"	11.00
B Grade E. F.	8.85	"	10.25
B Grade S. & S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.75
C Grade S. & S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.50
D Grade S. & S. C.	8.50	"	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight to Destination.

Bl. Softwood Sulphite	$76.00		
Unbl. Softwood Sulphite	64.00	@	66.00
Bl. Hardwood Sulphite	73.50		
Unbl. Hardwood Sulphite	63.50		
Bl. Mitscherlich	81.00		
Unbl. Mitscherlich	72.00		
N. Bleached Sulphate	86.00		
S. Bleached Sulphate	79.00		
N. Semi-Bleached Sulphate	82.00		
S. Semi-Bleached Sulphate	75.00		
N. Unbl. Sulphate	73.00		
S. Unbl. Sulphate	63.50		
Bl. Soda	66.00		
Unbl. Soda	82.00		
Groundwood	46.00		

Transportation Allowances Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	$11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum price.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1.	8.00	@	8.25
Silesias No. 1	4.50	"	4.75
New Unbleached	8.00	"	8.25
Blue Overall	5.75	"	6.00
Fancy	3.00	"	3.25
Washables	2.50	"	2.75
Mixed Khaki Cuttings	2.50	"	2.75
O. D. Khaki Cuttings	3.00	"	3.15

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BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

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Williamsburg, Pennsylvania
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EXCELSIOR KNOX Woolen Co. Camden, Me. FELTS & JACKETS

BUT also a guarantee by men who for 78 years have prided themselves in making finer felts. TO YOU —this is the mark of dependability, longer felt life and greater saving.

KNOX WOOLEN CO.
CAMDEN, MAINE.

Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—

* Old Manila Rope.. 5.75 " —
*OPA Maximum Prices.

Foreign Rags

All prices nominal

New Rags			
New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25
Old Rags			
No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.00	@	4.25
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	4.75
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	4.25	"	4.75
Sisal Strings	3.25	"	3.75
Mixed Strings	1.10	"	1.20

* OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.37	"	—
Mixed Books	1.07½	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Mixed Ledger, colored	1.87½	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.85	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	1.75	"	—
Old Corrugated Containers	1.00	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—

Twines

(F. o. b. Mill)

(Soft Fiber)

Unpolished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17¼	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1	.07½	@	.07½
New White No. 2	.04½	"	.05
Light Silesias	.04½	"	.04¾
Silesias, No. 1	.04	"	.04¼
Black Silesias, soft	.03¾	"	.04
New Unbleached	.07¼	"	.07½
Washable Prints	.03¾	"	.03½
Washable No. 1	.02	"	.02¾
Blue Overall	.04½	"	.05½
Cottons—According to grades—			
Washable shredding	—	"	.01¾
Fancy Percales	.03¼	"	.03½
New Black Soft	.02¾	"	.03
New Dark Seconds	1.75	"	2.00
Khaki Cuttings—			
No. 1 O. D.	.03	"	.03¼
No. 2 Mixed	.02¾	"	.02½
Corduroy	.01¾	"	.02¼
New Canvas	.04¾	"	.05¼
New Black Mixed	—	"	.02½

Domestic Rags (Old)

White No. 1—Repacked	3.80	"	—
White No. 2—Repacked	2.90	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.50
Sisal Rope	3.75	"	—
Mixed Rope	.75	"	1.00
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines	1.37	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Box Board Cuttings	.72½	"	—
Jute Corrugated Cuttings	.90	"	—
Overissue News	.85	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Overissue News	.85	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old Corrugated Containers	1.00	"	—
Jute Corrugated Cuttings	1.07½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
Paper Mill Bagging	3.00	"	3.25
No. 2 Bagging	1.35	"	—*

* OPA Maximum Price.

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	4.50	@	5.00
Sisal Rope	5.00	"	5.50
Mixed Rope	1.25	"	1.40
Transmission Rope—			
Foreign	(nominal)		
Domestic	4.00	"	4.25
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	5.50	"	6.00
Jute Carpet Threads	3.25	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	4.50	"	—
Scrap Sisal	4.75	"	5.00
Scrap Sisal for Shredding	5.50	"	5.75
Wool Tares—			
Foreign	(nominal)		
Domestic	5.00	"	5.75
Aust. Wool Pouches	5.50	"	5.85
New Burlap Cuttings	5.50	"	5.75
Heavy Baling Bagging	5.00	"	5.25

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¾	"	.05
New White No. 1	.08	"	.08¼
New Light Flannelettes	.06	"	.06¼
Canton Flannel, Bleached	.08¼	"	.08½
Underwear Cutters, Bleached	.08	"	.08¼
Underwear Cutters, Unbleached	6.50	"	6.75
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03¼	"	.04
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.08¼	"	.08½
Blue Cheviots	.04¼	"	.05
Fancy	.02¾	"	—
Washable	.01¾	"	—
Cottons According to Grades—			
Blue Overalls	—	"	.03½
New Black, Soft	.03¼	"	.04
Khaki Cuttings	.04¼	"	.04¼
O. D. Khaki	.04½	"	.04¾
Corduroy	.02	"	.02¼
New Canvas	.06	"	.06¼
B. V. D. Cuttings	.07¼	"	.08

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—*
Miscellaneous	3.20	"	—*
White No. 2—			
Miscellaneous	2.65	"	—*
Twos and Blues, Repacked	2.20	"	—*
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—*
Miscellaneous	1.80	"	—*
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—*
No. 2	1.45	"	—*
No. 3	1.35	"	—*
No. 4	1.35	"	—*
No. 5, Quality A	1.35	"	—*
Quality B	1.20	"	—*
Quality C	.95	"	—*
* Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices.

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.50	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.17½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
No. 1 Roofing Rags	1.55	"	—
No. 2 Roofing Rags	1.45	"	—